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National Toxicology Program Review of Current DHHS (Department of Health and Human Services) DOE (Department of Energy), and EPA (Environmental Protection Agency) Research Related to Toxicology, Fiscal Year 1985

(U.S.) National Toxicology Program
Research Triangle Park, NC

Mar 85

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NATIONAL TOXICOLOGY PROGRAM

REVIEW OF CURRENT DHHS, DOE, AND EPA RESEARCH RELATED TO TOXICOLOGY

FISCAL YEAR 1985

NTP-85-056

MARCH 1985

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PUBLIC HEALTH SERVICE
DEPARTMENT OF HEALTH AND HUMAN SERVICES

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Contents: Department of Health and Human Services (DHHS) agencies' role in the support of toxicology research, testing, and methods development; Department of Energy (DOE) role in the support of toxicology research, testing, and methods development; Environmental Protection Agency (EPA) role in the support of toxicology research, testing, and methods development; Toxicology methods currently being developed by DHHS, DOE, and EPA; Chemical compounds currently being tested by DHHS, DOE, and EPA for toxicological properties; Chemical index by name; CAS registry number index; Chemical index by study type.

KEYWORDS: *Toxicology, *Research.

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DEPARTMENT OF HEALTH AND HUMAN SERVICES

NATIONAL TOXICOLOGY PROGRAM

Review of Current DHHS, DOE, and EPA Research Related to Toxicology

TABLE OF CONTENTS

Introduction 1

Overview 2

Funding and Personnel 3

Department of Health and Human Services (DHHS) Agencies' Role in the Support of Toxicology Research, Testing, and Methods Development 15

- National Cancer Institute 16
- National Institute of Environmental Health Sciences 19
- Food and Drug Administration 27
- National Institute for Occupational Safety and Health 28
- National Eye Institute 31
- National Heart, Lung, and Blood Institute 32
- National Institute of Allergy and Infectious Diseases 34
- National Institute of Arthritis, Diabetes, and Digestive and Kidney Diseases 35
- National Institute of Child Health and Human Development 36
- National Institute of Dental Research 39
- National Institute of General Medical Sciences 40
- National Institute of Neurological and Communicative Disorders and Stroke 41
- National Institute on Aging 42
- National Library of Medicine 43
- Division of Research Resources 46
- Division of Research Services 48
- Alcohol, Drug Abuse, and Mental Health Administration 49

Department of Energy (DOE) Role in the Support of Toxicology Research, Testing, and Methods Development 51

Environmental Protection Agency (EPA) Role in the Support of Toxicology Research, Testing, and Methods Development 55

cont on 3 →

Toxicology Methods Currently Being Developed by DHHS, DOE, and EPA

- National Cancer Institute 63
- National Institute of Environmental Health Sciences 68
- Food and Drug Administration 78
- Centers for Disease Control/National Institute for Occupational Safety and Health 113

2<

TABLE OF CONTENTS (Continued)

National Institute of Mental Health---------------------------------- 115
Department of Energy--- 118
Environmental Protection Agency-------------------------------------- 120

Chemical Compounds Currently Being Tested by DHHS, DOE, and EPA for Toxicological Properties

Introduction to Tables and Indices------------------------------------- 1

Agencies Testing Chemicals

National Cancer Institute-- 2
National Institute of Environmental Health Sciences------------------- 20
Food and Drug Administration-- 51
Centers for Disease Control/National Institute for Occupational Safety and Health--- 67
National Institute of Child Health and Human Development--- 70
National Heart, Lung, and Blood Institute----------------------------- 78
National Institute of Arthritis, Diabetes, and Digestive and Kidney Diseases----------------------------------- 88
National Institute of Allergy and Infectious Diseases----------------- 93
National Institute of Neurological and Communicative Disorders and Stroke--- 94
National Eye Institute-- 109
National Institute of Dental Research-------------------------------- 113
Division of Research Services-- 114
National Institute of Mental Health---------------------------------- 115
National Institute on Drug--- 116
Depart of Energy--- 117
Environmental Protection Agency-------------------------------------- 119
Chemical Index by Name--- 122
CAS Registry Number Index-- 153
Chemical Index by Study Type--- 165

Appendix: Requests to DHHS, DOE, and EPA for Information on Toxicology-Related Research

Request to DHHS Agencies--- 1
Request to DOE--- 7
Request to EPA--- 8

TABLE OF CONTENTS (Continued)

Addressees-- 9

Agency Contact Persons-- 11

4<

LIST OF TABLES

Table 1 Summary of FY 1985 Estimates of Support by DHHS, DOE, and EPA for Research Related to Chemical Toxicology---------- 6

Table 2 FY 1985 Summary Estimates of Funding Support by DHHS, DOE, and EPA for Research Related to Chemical Toxicology in Basic Research, Testing and Methods Development---------- 7

Table 3 FY 1985 Estimates of Funding Support by DHHS Agencies for Research Related to Chemical Toxicology in Basic Research, Testing and Methods Development---------- 8

Table 4 FY 1985 Summary Estimates of Personnel Support by DHHS, DOE, and EPA for Research Related to Chemical Toxicology in Basic Research, Testing and Methods Development---------- 11

Table 5 FY 1985 Estimates of Personnel Support by DHHS Agencies for Research Related to Chemical Toxicology in Basic Research, Testing and Methods Development---------- 12

5<

DEPARTMENT OF HEALTH AND HUMAN SERVICES
NATIONAL TOXICOLOGY PROGRAM

Review of Current DHHS, DOE, and EPA Research Related to Toxicology for Fiscal Year 1985

INTRODUCTION

Four agencies of the Public Health Service support research related to toxicology. Within the National Institutes of Health alone, eleven separate institutes and several other components all report some support for this research. Related research is also conducted by other Federal agencies -- particularly the Department of Energy and the Environmental Protection Agency.

Of the near $400 million in estimated FY 1985 expenditures by the Department of Health and Human Services, the Department of Energy and the Environmental Protection Agency, 64% was to be spent by the four charter agencies of the National Toxicology Program: the Food and Drug Administration, the National Cancer Institute, the National Institute of Environmental Health Sciences, and the National Institute for Occupational Safety and Health. Toxicology related research is central to their missions.

However, since these agencies contribute only a portion of their resources to NTP and since critical work is carried on by other agencies, an overall review is of considerable interest to research managers for purposes of coordinating research and reducing unnecessary duplication. Thus, the charter of the National Toxicology Program (NTP) requires the NTP Annual Plan to include a review of current Department of Health and Human Services (DHHS) research as it relates to toxicology. This is the seventh review of DHHS research related to toxicology; it includes for the fifth time a review of toxicology-related research of the Department of Energy (DOE) and the Environmental Protection Agency (EPA).

METHODS AND OVERVIEW

o METHODS

This review covers projections for Fiscal Year 1985, based on the President's proposed budget and made prior to August 31, 1984. It represents responses by agencies of DHHS,* and by DOE and EPA, to requests by the Director of NTP for information on agency programs in basic toxicology research, toxicology testing, and toxicology methods development.

This review covers thoroughly the activities of various components** of DHHS, DOE, and EPA in support of toxicology-related research, but does not

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* Only those DHHS agencies which previously indicated program activity in basic toxicology research, testing, or methods development were contacted for the FY 1985 report. See Appendix for request.

** The DOE response covered primarily the Health Effects Research Division of the office of Health and Environmental Research. The EPA response covered the Office of Health Research, Office of Research and Development.

6<

include information on toxicological testing as provided for by the Comprehensive Environmental Response, Compensation and Liability Act of 1980. It also does not include toxicology-related research activities supported by other Federal agencies such as the Department of Agriculture, the Department of Commerce, the Department of Interior, and the Department of Defense. In dollar amounts, however, the DHHS, DOE, and EPA role in toxicology-related research is estimated to be significantly greater than that of all remaining Federal agencies. Thus, this review reflects a substantial portion of total Federal support for this activity.

For the purpose of this review the following definitions were used:

Basic Toxicology Research -- Studies which provide information on adverse effects and fate of chemicals in biological systems including modifying factors. For example, studies which characterize the structure and/or function of biological systems are not appropriate for inclusion, unless the objective of the studies is to provide a frame of reference or baseline for detecting or understanding alterations in structure and/or function as a measure of chemical toxicity. Studies on how exogenous chemicals may modify structure/function are appropriate. Similarly, studies on normal DNA synthesis should not be included, but studies on DNA repair mechanisms are included.

Toxicology Testing -- Studies which provide information on the adverse effects of chemicals in biological systems using established test protocols. This includes chemicals being tested in vitro and in vivo in laboratory organisms as well as human epidemiological studies related to chemical exposure. Included are preclinical studies and Phase I clinical trials on the toxicity of chemotherapeutic agents. Studies dealing with adverse drug reactions are also appropriate for inclusion.

Toxicology Methods Development -- Studies aimed at developing and/or validating new methods, procedures, protocols, etc., for toxicology testing purposes.

Specifically excluded from these definitions is toxicology of physical environment factors such as noise, light, ionizing and non-ionizing radiation.

o OVERVIEW

Information on dollar and manpower support for agency activities in basic toxicology research, toxicology testing, and toxicology methods development provided by DHHS agencies, and by DOE and EPA, is summarized later in this report.

Narrative information provided by agencies on their role in the support of toxicology research, testing, and methods development is included beginning on page 16.

A number of agencies support programs which aim to develop and improve toxicology testing methodology. The development of faster, more reliable, and more predictive (of adverse health effects) testing methodology is a central function of the National Toxicology Program. Therefore, all agencies were

7<

requested to provide summary information on their programs related to toxicology methods development, whether as an essential or peripheral part of their mission responsibilities. The information provided in response to this request is summarized in tables on pages 63 to 128.

Information was also requested from agencies on chemical compounds currently being studied for their toxicological properties in research projects supported in intramural laboratories, through contracts, or through grants. This information is summarized in tables on pages 1 to 121.* It should be recognized that in some instances, testing for toxicologic properties is incidental to the main purpose of a project. A number of agencies do not consider their programs as supporting routine testing. Thus, the inclusion of compounds from these agencies is for information purposes only, and does not necessarily indicate involvement in or commitment to a program of toxicology testing.

FINDINGS

o AGENCY CONTRIBUTIONS TO TOXICOLOGY-RELATED RESEARCH

The overall support provided by DHHS, DOE, and EPA for chemical toxicology-related research, and that portion provided to the National Toxicology Program (NTP) is summarized in Table 1.

As shown in this table, DHHS, DOE, and EPA estimate a total of approximately $399 million in toxicology-related research in FY 1985. Approximately $256 million of the overall estimated funding level for FY 1985, or 64%, will be spent by the four charter agencies of the National Toxicology Program: FDA, NCI, NIEHS, and NIOSH. Of the total of $256 million that these four agencies estimate they will spend on toxicology-related research in FY 1985, they will contribute about $74 million to research projects being conducted under the NTP.

The total estimated figure to be spent on toxicology-related research by DHHS, DOE, and EPA in FY 1985 represents a 3.9% increase over FY 1984. Twelve agencies reported increases and five reported decreases in funding. The proportion of the NTP charter agencies' share (64%) remains unchanged from FY 1984. Overall, the DHHS agencies collectively estimate a 5.2% increase over FY 1984 reflecting a 5% increase by the four charter agencies of NTP, a smaller 3.5% increase by the NIH, and a 35.5% increase projected by the ADAMHA. The EPA estimates no change in FY 1985 in funding of chemical toxicology-related activities while DOE projects a decrease of about 17%.

Table 1 also summarizes estimates by DHHS, DOE, and EPA of professional scientific personnel (in staff-years) expected to be involved in chemical toxicology-related research activities in FY 1985. DHHS agencies anticipate a total of approximately 886 intramural (i.e., in-house) staff-years in FY 1985, (no change over 1984) while EPA projects about 276 staff-years for FY 1984 (an increase of about 11% over the last fiscal year). Comparable figures are not available from DOE. DHHS agencies will contribute approximately 244 intramural staff-years to research projects under the National Toxicology Program, about a 3.6% decrease in professional staff-years over FY 1984.

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* Section of the Review on Chemical Testing

8<

o HOW THESE CONTRIBUTIONS ARE ALLOCATED

Tables 2 and 3 estimate the support in FY 1985 for toxicology-related research divided into the categories of basic research, chemical testing, and methods development.*

Of the $399 million total estimated for toxicology-related research in FY 1985, approximately $194 million (49%) will support basic research projects, $149 million (37%) will support toxicology testing, and $56 million (14%) will support toxicology methods development. This represents a stable allocation of resources among these critical program areas. The total estimated FY 1985 direct contribution of $74 million to the NTP represents approximately 18.5% of total DHHS, DOE, and EPA support for toxicology-related research, and represents little change from FY 1984.

More than one-third of the total funding available in DHHS, DOE, and EPA for toxicology methods development and testing is allocated to the NTP. Of the total $149 million estimated for toxicology testing in FY 1985, the NTP agencies will control $97 million (65%). Of this amount, approximately $56 million will be contributed directly to the NTP. Of the $56 million estimated for toxicology methods development in FY 1985, $36 million (64%) is accounted for by the NTP agencies, of which about $17 million will be contributed to the Program.

The largest portion of Federal funding is devoted to basic toxicology research. Of the total $399 million spent by DHHS, DOE and EPA in FY 1985, an estimated $194 million will be devoted to basic research. Of this figure, $123 million (or 63%) is controlled by the NTP charter agencies; only a small amount is contributed directly to the NTP ($0.8 million).

Finally, Tables 4 and 5 provide estimates for FY 1985 of the number of DHHS and EPA intramural staff-years involved in research related to toxicology, divided into the categories of basic research, testing, and methods development. Overall, there were no changes projected in staff-year allocations for DHHS agencies between FY 1984 and FY 1985. For EPA, there was an 11% increase projected in FY 1985 over FY 1984 estimates.

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* Funding estimates in Tables 1 to 3 do not include Superfund dollars that the NTP receives under an interagency agreement with the Agency for Toxic Substances and Disease Registry, Center for Environmental Health, Centers for Disease Control. This funding, $4,881,000 in FY 1985, is to provide for toxicological testing of chemicals that have been identified as being present in priority hazardous waste sites under the Comprehensive Environmental Response, Compensation and Liability Act of 1980 (CERCLA).

9<

The remainder of this review consists of narrative and tabular information provided by the DHHS agencies, DOE, and EPA on their respective roles in the support of toxicology research, testing, and methods development.*

Note that many of the toxicology research, testing and methods development activities for the three current participating agencies (NCTR, NIEHS and NIOSH), which are summarized in the Review, are described more fully in the companion volume, the FY 1985 NTP Annual Plan. The Annual Plan may be obtained without charge by contacting:

NTP Public Information Office
MD B2-04
P.O. Box 12233
Research Triangle Park, NC 27709
Telephone: (919)541-3991; FTS 629-3991

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* Tabular information on toxicology methods development and toxicology testing supported by the Division of Research Resources (DRR), NIH, was not available in time for inclusion in the Review. For specific information on DRR activities in these areas, an agency contact with telephone number is given in the back of the Appendix.

TABLE 1: SUMMARY

FY 1985 ESTIMATES OF SUPPORT BY DHHS, DOE, AND EPA FOR RESEARCH RELATED TO CHEMICAL TOXICOLOGY[1]

	$ in thousands		intramural professional staff-years	
	Total	NTP[2]	Total	NTP[2]
DEPARTMENT OF HEALTH AND HUMAN SERVICES	349,601	74,142	886.27	244.3
National Toxicology Program Agencies	255,917	74,142	779.0	244.3
National Cancer Institute/NIH	89,594	-0-	68	-0-
National Institute of Environmental Health Sciences/NIH	130,421	65,506	363	187
Food and Drug Administration	33,085	5,820	320.7	30
National Institute for Occupational Safety and Health/CDC	2,816	2,816	27.3	27.3
National Institutes of Health	79,227	-0-	107.27	-0-
National Eye Institute	1,960	-0-	-0-	-0-
National Heart, Lung, and Blood Institute	6,577	-0-	8.9	-0-
National Institute of Allergy and and Infectious Diseases	2,508	-0-	-0-	-0-
National Institute of Arthritis, Diabetes, and Digestive and Kidney Diseases	3,937[3]	-0-	38.1[4]	-0-
National Institute of Child Health and Human Development	5,793	-0-	9	-0-
National Institute of Dental Research	2,702	-0-	1.27	-0-
National Institute of General Medical Sciences	7,451	-0-	-0-	-0-
National Institute of Neurological and Communicative Disorders and Stroke	28,074	-0-	48	-0-
National Institute on Aging	-0-	-0-	-0-	-0-
National Library of Medicine	-0-	-0-	-0-	-0-
Division of Research Resources	20,125	-0-	-0-	-0-
Division of Research Services	100	-0-	2	-0-
Alcohol, Drug Abuse, and Mental Health Administration	14,457	-0-	-0-	-0-
National Institute of Mental Health	995	-0-	-0-	-0-
National Institute on Alcohol Abuse and Alcoholism	13,169	-0-	-0-	-0-
National Institute on Drug Abuse	292	-0-	-0-	-0-
DEPARTMENT OF ENERGY	9,550	-0-	*	-0-
ENVIRONMENTAL PROTECTION AGENCY	39,838	-0-	275.9	-0-
TOTALS	398,989	74,142	1,162.17	244.3

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[1] Based on the FY 1985 President's proposed budget.
[2] Figures indicate projected commitments to NTP for FY 1985.
[3] Incomplete estimate excluding amounts for intramural research.
[4] Based on actual FY 1983 intramural staff-years.
*Figures not available.

TABLE 2

FY 1985 SUMMARY ESTIMATES OF FUNDING SUPPORT BY DHHS, DOE, AND EPA FOR RESEARCH RELATED TO CHEMICAL TOXICOLOGY IN BASIC RESEARCH, TESTING AND METHODS DEVELOPMENT[1]

($ in thousands)

	Basic Research	Testing	Methods Development	Total
Department of Health and Human Services	191,047.8	121,839.7	36,713.9	349,601.4
Department of Energy[2]	2,358	5,139	2,053	9,550
Environmental Protection Agency[3]	896.0[4]	22,045.0	16,897.1	39,838.1

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[1] Based on the FY 1985 President's proposed budget.

[2] Most toxicology related research is sponsored and administered by the Health Effects Research Division of the Office of Health and Environmental Research.

[3] Toxicology related research is conducted by the Office of Health Research of the Office of Research and Development. Dollar estimates do not include the following support activities: OHR Headquarters support, Task Force on Environmental Cancer and Heart and Lung Disease, Health Effects Institute, and other miscellaneous support such as certain data processing activities.

[4] The primary purpose of the research is not to provide basic scientific information, but rather to meet specific regulatory or programmatic needs.

TABLE 3

FY 1985 ESTIMATES OF FUNDING SUPPORT BY DHHS AGENCIES FOR RESEARCH RELATED TO CHEMICAL TOXICOLOGY IN BASIC RESEARCH, TESTING AND METHODS DEVELOPMENT[1]

($ in thousands)

	Basic Research		Testing		Methods Development		Total	
National Toxicology Program Agencies	122,975.8	802.8[2]	97,435.7	56,218.7[2]	35,505.9	17,120.9[2]	255,917.4	74,142.4[2]
National Institutes of Health	109,442	0	86,350	50,457	24,223	15,049	220,015	65,506
National Cancer Institute	51,596	0	33,102[3]	0	4,896	0	89,594	0
National Institute of Environmental Health Sciences	57,846	0	53,248	50,457	19,327	15,049	130,421	65,506
Food and Drug Administration	12,731	0	9,594	4,270	10,761	1,550	33,086	5,820
Center for Drugs and Biologics	500		-0-		-0-		500	
Center for Food Safety and Applied Nutrition	2,380		1,251		2,986		6,617	
Center for Devices and Radiological Health	-0-		-0-		100		100	
Center for Veterinary Medicine	588		93		115		796	
National Center for Toxicological Research	9,263	0	8,250	4,270	7,560	1,550	25,073	5,820
Centers for Disease Control	802.8	802.8	1,491.7	!,491.7	521.9	521.9	2,816.4	2,816.4
Center for Environmental Health	-0-		-0-		-0-		-0-	
Center for Health Promotion and Education	-0-		-0-		-0-		-0-	
Center for Infectious Diseases	-0-		-0-		-0-		-0-	
Center for Prevention Services	-0-		-0-		-0-		-0-	
Center for Professional Development and Training	-0-		-0-		-0-		-0-	
National Institute for Occupational Safety and Health	802.8	802.8	1,491.7	1,491.7	521.9	521.9	2,816.4	2,816.4

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[1] Based on the FY 1985 President's proposed budget.

[2] Figures indicate projected commitments to NTP for FY 1985.

[3] This amount includes support for pre-clinical screening and testing of chemotherapeutic agents not specifically for toxicity ($28,275) as well as toxicity testing ($2,600). In addition, it includes Phase I trials ($2,227).

TABLE 3 (CONTINUED)

FY 1985 ESTIMATES OF FUNDING SUPPORT BY DHHS AGENCIES FOR RESEARCH RELATED TO CHEMICAL TOXICOLOGY IN BASIC RESEARCH, TESTING AND METHODS DEVELOPMENT[1]

($ in thousands)

	Basic Research	Testing	Methods Development	Total
National Institutes of Health	53,615	24,404	1,208	79,227
National Eye Institute	1,960	-0-	-0-	1,960
National Heart, Lung, and Blood Institute	4,750	1,827	-0-	6,577
Division of Heart and Vascular Diseases	1,104	595	-0-	1,699
Division of Lung Diseases	2,642	1,027	-0-	3,669
Division of Blood Diseases and Blood Resources	381	205	-0-	586
Division of Intramural Research	623	-0-	-0-	623
National Institute of Allergy and Infectious Diseases	511	1,997	-0-	2,508
National Institute of Arthritis, Diabetes, and Digestive and Kidney Diseases	1,385[2]	2,552[2]	-0-	3,937[2]
National Institute of Child Health and Human Development	1,836	3,957	-0-	5,793
Center for Population Research	270	2,066	-0-	2,336
Center for Research on Mothers and Children	1,566	1,891	-0-	3,457
National Institute of Dental Research	2,629	73	-0-	2,702
National Institute of General Medical Sciences	7,451	-0-	-0-	7,451
Genetics Program	4,529	-0-	-0-	4,529
Pharmacological Sciences Program	2,922	-0-	-0-	2,922

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[1] Based on the FY 1985 President's proposed budget.

[2] Incomplete estimate excluding amounts for intramural research.

TABLE 3 (CONTINUED)

FY 1985 ESTIMATES OF FUNDING SUPPORT BY DHHS AGENCIES FOR RESEARCH RELATED TO CHEMICAL TOXICOLOGY IN BASIC RESEARCH, TESTING AND METHODS DEVELOPMENT[1]

($ in thousands)

	Basic Research	Testing	Methods Development	Total
National Institute of Neurological and Communicative Disorders and Stroke	20,740	7,334	-0-	28,074
National Institute on Aging	-0-	-0-	-0-	-0-
National Library of Medicine	-0-	-0-	-0-	-0-
Division of Research Resources	12,253	6,664	1,208	20,125
Division of Research Services	100	-0-	-0-	100
Alcohol, Drug Abuse, and Mental Health Administration	14,457	-0-	-0-	14,457
National Institute of Mental Health	995	-0-	-0-	995
National Institute on Alcohol Abuse and Alcoholism	13,169	-0-	-0-	13,169
National Institute on Drug Abuse	292	-0-	-0-	293
TOTALS	191,047.8	121,839.7	36,713.9	349,601.4

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[1] Based on FY 1985 President's proposed budget.

TABLE 4

FY 1985 SUMMARY ESTIMATES OF PERSONNEL SUPPORT BY DHHS, DOE, AND EPA FOR RESEARCH RELATED TO CHEMICAL TOXICOLOGY IN BASIC RESEARCH, TESTING, AND METHODS DEVELOPMENT[1]

(in intramural professional staff-years)

	Basic Research	Testing	Methods Development	Total
Department of Health and Human Services	444.8	209.47	232.0	886.27
Department of Energy	*	*	*	*
Environmental Protection Agency[2]	11.2[3]	139.2	125.5	275.9

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[1] Based on the FY 1985 President's proposed budget.

*Figures not available.

[2] Toxicology related research is conducted by the Office of Health Research of the Office of Research and Development. Staff-year estimates do not include Headquarters support and other miscellaneous support such as certain data processing activities.

[3] The primary purpose of the research is not to provide basic scientific information, but rather to meet specific regulatory or programmatic needs.

TABLE 5

FY 1985 ESTIMATES OF PERSONNEL SUPPORT BY DHHS AGENCIES FOR RESEARCH RELATED TO CHEMICAL TOXICOLOGY IN BASIC RESEARCH, TESTING, AND METHODS DEVELOPMENT[1]

(in intramural professional staff-years)

	Basic Research		Testing		Methods Development		Total	
National Toxicology Program Agencies	360.9	9.0[2]	186.1	130.7[2]	232.0	104.6[2]	779.0	244.3[2]
National Institutes of Health	212	0	104	101	115	86	431	187
National Cancer Institute	62	0	3	0	3	0	68	0
National Institute of Environmental Health Sciences	150	0	101	101	112	86	363	187
Food and Drug Administration	139.9	0	70.4	18	110.4	12	320.7	30
Center for Drugs and Biologics	8.7		0		0		8.7	
Center for Food Safety and Applied Nutrition	46.2		29.9		72.9		149.0	
Center for Devices and Radiological Health	0		0		2.0		2.0	
Center for Veterinary Medicine	7		0.5		7.5		15.0	
National Center for Toxicological Research	78	0	40	18	28	12	146.0	30
Centers for Disease Control	9.0	9.0	11.7	11.7	6.6	6.6	27.3	27.3
Center for Environmental Health	-0-		-0-		-0-		-0-	
Center for Health Promotion and Education	-0-		-0-		-0-		-0-	
Center for Infectious Diseases	-0-		-0-		-0-		-0-	
Center for Professional Development and Training	-0-		-0-		-0-		-0-	
National Institute for Occupational Safety and Health	9.0	9.0	11.7	11.7	6.6	6.6	27.3	27.3

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[1] Based on the FY 1985 President's proposed budget.

[2] Figures indicate projected commitments to NTP for FY 1985.

TABLE 5 (CONTINUED)

FY 1985 ESTIMATES OF PERSONNEL SUPPORT BY DHHS AGENCIES FOR RESEARCH RELATED TO CHEMICAL TOXICOLOGY IN BASIC RESEARCH, TESTING, AND METHODS DEVELOPMENT[1]

(in intramural professional staff-years)

	Basic Research	Testing	Methods Development	Total
National Institutes of Health	83.9	23.37	-0-	107.27
National Institute of Child Health and Human Development	9	-0-	-0-	9
National Institute of General Medical Sciences	-0-	-0-	-0-	-0-
National Institute of Neurological and Communicative Disorders and Stroke	31	17	-0-	48
National Institute of Arthritis, Diabetes and Digestive and Kidney Diseases	33.0[2]	5.1[2]	-0-	38.1[2]
Division of Research Resources	-0-	-0-	-0-	-0-
National Heart, Lung, and Blood Institute	8.9	-0-	-0-	8.9
National Institute of Dental Research	-0-	1.27	-0-	1.27
National Eye Institute	-0-	-0-	-0-	-0-
National Institute on Aging	-0-	-0-	-0-	-0-
National Institute of Allergy and Infectious Diseases	-0-	-0-	-0-	-0-
National Library of Medicine	-0-	-0-	-0-	-0-
Division of Research Services	2	-0-	-0-	2

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[1] Based on the FY 1985 President's proposed budget.

[2] Based on actual FY 1983 intramural staff-years.

TABLE 5 (CONTINUED)

FY 1985 ESTIMATES OF PERSONNEL SUPPORT BY DHHS AGENCIES FOR RESEARCH RELATED TO CHEMICAL TOXICOLOGY IN BASIC RESEARCH, TESTING, AND METHODS DEVELOPMENT[1]

(in intramural professional staff-years)

	Basic Research	Testing	Methods Development	Total
Alcohol, Drug Abuse, and Mental Health Administration	-0-	-0-	-0-	-0-
National Institute of Mental Health	-0-	-0-	-0-	-0-
National Institute on Alcohol Abuse and Alcoholism	-0-	-0-	-0-	-0-
National Institute on Drug Abuse	-0-	-0-	-0-	-0-
TOTALS	444.8	209.47	232.0	886.27

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[1] Based on the FY 1985 President's proposed budget.

DHHS AGENCIES' ROLE IN THE SUPPORT OF TOXICOLOGY RESEARCH, TESTING AND METHODS DEVELOPMENT

20<

NATIONAL CANCER INSTITUTE

Overview

The goal of the National Cancer Institute is to develop the means for reducing the incidence, morbidity, and mortality of cancer in humans. Toward this goal, the NCI sponsors research in four major thrust areas, i.e., cause and prevention research, detection and diagnosis research, treatment research, and cancer biology. The thrust areas are broken down into research programs in epidemiology, carcinogenesis (physical and chemical), biological carcinogenesis (viral oncology), nutrition, tumor biology, immunology, diagnostic research, preclinical treatment research, clinical treatment research, and rehabilitation research.

Each research program sponsors a broadly based effort within the confines o its mandate. In this context, toxicology-related research is an important component of a number of research programs. Such research includes the identification of populations at increased cancer risk attributable to various lifestyle factors such as dietary habits and smoking as well as to exposures to chemicals, investigations on the effects and biological fate of carcinogens and structurally similar compounds, development of new methods for detecting chemical carcinogens, studies on the toxicological and other effects of potential cancer chemotherapeutic and chemopreventive agents, and clinical studies to characterize the toxicity of cancer chemotherapeutic agents.

Basic Toxicology Research

The program areas outlined below have been developed for the convenience of this report and do not necessarily correspond to any NCI research program defined for budgetary, organizational, or other purpose.

Carcinogenesis

Research in this program area is directed toward the elucidation of the biological fate of chemical carcinogens and the mechanisms by which they exert their effects. Basic research includes studies on the effects of tumor promoters, carcinogens and co-carcinogens on cell structure and function, the relationships between molecular structure and carcinogenic activity, enzyme systems associated with the metabolic activation of procarcinogens to carcinogenic forms and with the detoxification of carcinogens, the effects of the binding of carcinogens to DNA, and systems that repair DNA damage. Studies are conducted in whole animal models, mammalian organ and cell culture (including human) systems, and in *in vitro* microbial and other submammalian systems.

Preclinical

Research in this program area is directed primarily toward the development of new antitumor drugs. Such drugs may include natural development of new substances, synthetic chemicals, and microbial products. Basic research includes studies in biochemical pharmacology, drug metabolism, pharmacokinetics, and drug interactions. Studies on the toxicity associated with radiotherapy and chemotherapy are also in progress. In the area of radiation toxicology, problems related to the late effects of radiation on normal animal tissues are being evaluated. Studies on the prevention of the acute and chronic adverse effects of antitumor agents, as well as their mutagenic and carcinogenic effects, are also underway. These studies are conducted at the whole body, cellular, and molecular levels. Research involving the screening of chemicals for antitumor activity is reported under Toxicology Testing.

Toxicology Testing

The areas outlined below have been developed for the convenience of this report and do not necessarily correspond to any NCI research program defined for budgetary, organizational, or other purpose.

Epidemiology

This program area is directed toward the identification of populations at increased cancer risk resulting from lifestyle factors and environmental or occupational exposures to chemical, physical or biological agents. Epidemiologic studies of selected occupational groups help to identify chemical and physical carcinogens, and studies of radiation-exposed groups clarify the shape of the dose-response curve. Other epidemiologic studies assess the late effects of treatment for childhood cancer, the effects of exogenous hormones, immunosuppressive and cytotoxic agents, and other drugs suspected of being carcinogenic. Analytic epidemiologic studies of suspected factors associated with risk of developing cancer are performed using worker populations in specific industries and trades. A major emphasis has been placed on a new research area called biochemical and molecular epidemiology. This area involves the incorporation of newly-developed biochemical techniques into traditional epidemiologic investigations and the refinement of these procedures into safe, accurate, reliable and informative adjuncts to human investigations. These techniques are being used to accurately characterize exposure to environmental/occupational carcinogens and for identifying measures which may impact or reverse the carcinogenic process. The primary goal in these investigations is to identify individuals at increased cancer risk by obtaining pathobiological evidence of high exposure of target cells to carcinogens and/or increased susceptibility due to inherited or acquired host factors.

Preclinical Screening

This program area is directed toward the development of new and more efficacious tumor therapies. A broad spectrum of chemicals is screened for antitumor activity in vitro against human stem cells and animal tumor cells; subsequently, antitumor activity against a panel of animal tumors and human tumor xenografts is assessed. Chemicals screened for activity include synthetic chemicals including radiosensitizers and radioprotectors, natural substances, biological response modifiers, and microbial products.

Phase I Clinical Trials

This program area is directed toward the earliest clinical assessment of new antitumor drugs. It is responsible for establishing maximum tolerated doses at various test schedules. Studies also are conducted to determine if toxic effects are predictable, treatable, or reversible.

22<

Toxicology Methods Development

The program areas outlined below have been developed for the convenience of this report and do not necessarily correspond to any NCI research program defined for budgetary, organizational, or other purpose.

In Vitro Model Systems

This program area is responsible for the development of short-term in vitro assays to provide a research tool for studying the mechanisms of action of chemical carcinogens and for developing strategies for prevention. The major models in use or under development include mammalian cell transformation assays, an isolated rat hepatocyte system, keratinocytes maintained in long-term cultures, mutagenicity in microorganisms, sister chromatid exchange and other chromosomal alterations in mammalian cells, and long-term culture of human bronchial, esophageal and other cells and tissue. Other models include in vitro studies of DNA repair following exposure to toxins and interactions between chemical carcinogens and target macromolecules.

Whole Animal Models

This program is responsible for developing and maintaining new animal models for use in carcinogenesis research. Models include inbred strains of mice genetically more sensitive or more resistant to chemical carcinogens and primate species for use in pharmacologic, toxicologic, and chemical carcinogenesis studies and in studies of transplacental carcinogenesis.

23<

NATIONAL INSTITUTE OF ENVIRONMENTAL HEALTH SCIENCES

Overview

The NIEHS has the broadest responsibility among Federal agencies for the support of research and the training of research manpower in the area of the effects of chemical environmental agents on human health. Its primary mission is to conduct and support biomedical research which will identify, characterize, and aid in preventing the adverse effects of these agents on human health. The research is essential to development of strategies and technologies which will prevent human disease caused by environmental agents.

Research activities generally fall into three separate but interrelated areas as follows:

1. Research aimed at identifying the fundamental processes through which environmental agents damage biological systems, providing a rational basis for devising of measures for detection of health effects and evaluation of their consequences.
2. Research aimed at the development, validation, and application of test systems which can detect and characterize the toxicity of chemical agents found in the environment.
3. Research activities which extend laboratory studies to risk assessment and epidemiology.

The NIEHS' research and development activities can be divided primarily between basic toxicology research and toxicology method development and validation. Most of the Institute's toxicology testing is conducted under the National Toxicology Program through its collaborative research program (contracts and interagency agreements) especially in the areas of (a) carcinogenesis, (b) toxicologic characterization of effects other than carcinogenesis, and (c) mutagenic effects. Epidemiological studies related to chemical exposure are largely effected through the collaborative research program, also.

The overall output of the NIEHS programs is intended to aid those agencies, organizations and individuals with responsibilities for developing and instituting pollution control regulations, or preventive and therapeutic measures for environmentally related diseases.

Basic Toxicology Research

NIEHS supports basic toxicology research aimed at identifying the toxicity of environmental chemicals, characterizing their metabolic fate, and gaining an understanding of the biological and biochemical mechanisms involved in environmentally related diseases. Research subjects range from population groups and whole organisms to molecules. This research may focus on effects and underlying scientific principles which apply to one or several organ systems, and tissues, or it may focus on disease states; e.g., carcinogenesis, mutagenesis, or teratogenesis, in specific target organs.

Research studies are conducted in the following areas:

1. Identifying, characterizing and quantifying, to the extent possible, the mutagenicity, teratogenicity, carcinogenicity and target organ toxicity of a wide variety of chemicals humans are exposed to in the home, workplace, and general environment. Included are heavy metals, air pollutants (gases, vapors and particulates with some emphasis on automotive combustion products), industrial organic solvents, polycyclic, aromatic and aliphatic hydrocarbons, polyhalo-genated hydrocarbons (especially biphenyls, dioxins and furans), pesticides/herbicides, hormonally active chemicals such as DES, and natural toxins. Many of these chemical classes are subjects of the following types of investigations.

2. Pharmacological studies are being carried out to elucidate the relationships between the biotransformation and translocation of chemicals and toxicity in various target organs and cells of the body. In these studies pharmacological and pharmacokinetic concepts are being used to characterize, in detail, the mechanisms by which environmental contaminants exert adverse biological effects. Included are studies: to evaluate species/sex/organ differences in distribution and activity of xenobiotic metabolizing enzyme systems; to determine the metabolic bases for selective/specific damage to certain organs and cell types which is characteristic of some toxins; to determine how hormonally active chemicals alter the normal functions of organ systems; to determine the role of membrane structure and function in toxicity and absorption, distribution and excretion of pollutants; to correlate organ and cell structure with function both before and after exposure to chemicals; and to provide reliable endpoints for the extrapolation of dose dependent chemical effects across animal species and to humans.

3. Studies on the pathological, biochemical and molecular mechanisms through which chemicals interact with biological receptors to produce toxic responses. Included are studies on the physicochemical interactions of chemicals, especially metals and hydrocarbons, with purified and isolated biological macromolecules as well as *in vivo*. Emphasis is placed on detection and identification of reactive free radicals generated from environmental chemicals, and on the interaction of light with chemical agents in biological systems to produce photosensitization. Considerable emphasis is being given to studying mechanisms of tumor promotion.

4. Research on pulmonary system toxicology includes investigation of mechanisms of injury and repair resulting from exposure to pollutants, and study of the pathogenesis of specific disorders such as pulmonary fibrosis and emphysema. The various cellular and tissue alterations produced in pulmonary tissue by environmental carcinogens are being studied histochemically and ultrastructurally, as are the co-carcinogenic and fibrotic effects of asbestos. Research continues on how the pulmonary system disposes of inhaled pollutants, and how pulmonary defense mechanisms modify toxicity. Conversely, the effects of air pollutants on pulmonary defense mechanisms against microbial pathogens are being evaluated. Mathematical deposition models are being developed. Studies include detailed examinations of the activity

and cellular location of enzyme systems in the lungs which activate and/or detoxify drugs and foreign chemicals. Pulmonary hypersensitivity to industrial chemicals is being studied in a system using guinea pigs as a model.

5. Research in behavioral and neurological toxicology is aimed at detecting changes, especially early changes, in nervous system function produced by long-term, low level exposure of organisms to chemical factors in the environment, understanding underlying mechanisms, and examining conditions which may increase individual susceptibility to neurotoxicity. Special emphasis is given to studies during postnatal phases of development. Other studies are concerned with determining the biochemical bases for such toxicity. Physiological studies are continuing on the role that neural barrier tissues play in the uptake and transport of tracer amounts of heavy metals from the systemic circulation, and on the toxic mechanisms involved. There is continuing emphasis on characterizing the neurobehavioral effects of pesticides, especially organochlorines, and organometals.

6. Research in developmental and reproductive toxicology ranges from studying molecular mechanisms of toxicity through the pharmacokinetics of chemicals in reproductive organs, such as the testes, to development of model systems for humans, such as the mouse model, for predicting and understanding toxic effects on the human reproductive tract of hormonally active chemicals. Emphasis is given to three major areas: male and female reproductive processes; teratogenesis; and postnatal effects of chemical exposure during gestation and lactation.

7. Research continues with other organs which are exposed to and/or play a role in the disposition of chemical toxicants.

   a) Intestines - Problems of intestinal toxicology and function at the cellular, subcellular and molecular level are being investigated including areas that represent unknowns in the field of intestinal absorption and metabolism that may be related to selective/specific gut toxicoses. There is a particular interest in the interactions of lipophilic toxins, such as TCDD, with the intestinal absorption of lipid and the mobilization and utilization of endogenous lipid as a basis for understanding toxicity.

   b) Liver - Of concern are the various aspects of hepatotoxicity emphasizing the more subtle alterations in liver function following exposure to environmental agents. Investigators are characterizing the role of endocrine action in the regulation of hepatic function in control and pollutant-treated animals, including the role of hormone receptors and toxicant-receptor interactions. Other studies are aimed at elucidating the mechanisms by which chemicals, especially halogenated solvents, produce liver damage.

c) Kidneys - In-depth studies continue on the nephrotoxicology of halogenated aliphatic chemicals and heavy metals with the purpose of defining a common cellular or subcellular mechanism of action.

8. The NIEHS continued to serve in a focal role within NIH and DHHS for marine and freshwater biomedical research. In this context, investigations concern a possible direct impact on human health by contaminants present in the aquatic environment (including drinking water) and accumulated by aquatic animals. A major emphasis in aquatic research focused on toxication-detoxication systems, transport and excretory mechanisms and membrane toxicity. The uptake, distribution, metabolism, and excretion of pollutants by various aquatic species, and the role of metabolism in the storage and the chemical form of the accumulated xenobiotics in these species is being assessed with major emphasis on how, why and where aquatic species accumulate pollutants which have potential for harm to man and whether or not mixtures of pollutants may lead to accumulation of more toxic forms of higher levels of pollutants than single chemical exposure. Aquatic species are examined for their suitability and sensitivity in toxicity testing, especially carcinogenesis and mutagenesis. Other studies are concerned with chelation, transport and toxicity of metals, and the effects of aquatic pollutants on red blood cells, respiratory enzymes and nervous tissue.

9. Research in genetic toxicology focuses on evaluating the molecular nature of mutation and repair processes, characterizing the various types of mutational events produced, and isolating and characterizing mutant mammalian proteins and enzymes which may serve as markers for chemically-induced mutations in laboratory test systems. Efforts continue to determine the mutagenic and carcinogenic mechanisms of various known mutagens and carcinogens including nitrosamines, aflatoxins, and polycyclic hydrocarbons, and including structure-activity correlations. The mechanisms for induction of mutations in mammalian cells in vivo are being studied, with several different selection and detection mechanisms used for recognizing the mutant cells. Work is also concerned with developing methods for detecting germinal mutations and the consequences of germinal mutations.

10. Research continues on the effects and mechanisms of chemical toxicity in other target organ systems, including the cardiovascular, blood forming, dermal, endocrine and immune systems.

Toxicology Testing

The NIEHS does relatively little toxicology testing in its intramural research and extramural research grants programs with two major exceptions. As human epidemiological studies are categorized for this exercise under Toxicology Testing, there is a large extramural and much smaller intramural effort in epidemiological studies related to chemical exposure. The intramural epidemiology program is supported primarily through research contracts and interagency agreements. The major laboratory commitments to toxicology testing are divided

27<

between intramural laboratory components of the NTP and studies conducted under the collaborative research program. Included are testing for carcinogenicity, neurobehavioral toxicity, immunotoxicity, general and target organ toxicity, reproductive and developmental toxicity and teratogenicity and genetic toxicity. The largest single efforts relate to short-term testing for mutagenic effects and prechronic and two-year animal studies for toxicologic and carcinogenic effects of chemicals.

Toxicology testing activities include:

1. Epidemiological studies in the intramural program are primarily con-concerned with understanding the environmental etiologies of chronic disease. Particular emphases have been placed on determining what effects pollutant exposure have on reproduction and on postnatal development. A large scale study on the effects on nursing offspring of contamination of breast milk by organochlorine chemicals continues through long-term follow-up for developmental toxicity in infants and children. Field studies continue to address the role of environmental factors in the etiology of some less well studied chronic diseases with special emphasis on chronic renal disease. A comprehensive laboratory program has been inaugurated to develop assays that will generate sensitive measures of the effects of environmental exposures on human populations. Initial efforts are on methods for detecting genetic damage and altered chemical metabolism in human body fluids and tissues with subsequent field testing of assays in an epidemiologic setting.

2. Epidemiological studies in the extramural program are generally of three types: (a) general population, e.g., effects of air pollutants in cities; (b) occupational populations, e.g., rubber workers, asbestos workers, etc., or, (c) special populations. Ongoing epidemiologic studies include assessing the relationship of particulate and gaseous pollutant exposure to acute and chronic lung diseases with such agents as SO_2, NO_x, ozone, hydrocarbons, various occupationally hazardous substances such as bischloromethylether, fluorocarbon polymers, and fibers such as fiberglass and asbestos. Epidemiological survey studies include the relationship between lead and disease in children, smoking and cancer, and surveys of such substances as vinyl chloride, polybrominated biphenyls, trichloroethylene, anesthetics, styrene, and various solvents. Other studies are concerned with the neurobehavioral effects of heavy metals in workers; polychlorinated biphenyl burdens in workers; the effects of halogenated hydrocarbons, e.g., PBBs and DBCP, on spermatogenesis; the genotoxic effects of arsenites and arsenates; and the pulmonary, hepatic and neurotoxic effects in workers of herbicides and PBBs.

3. Laboratory animal testing, primarily prechronic and chronic (two-year) studies with some testing done in intramural laboratories but with most of the efforts performed under contract. All the testing protocols include one or more special studies aimed at providing a broad toxicologic characterization of chemicals for carcinogenicity as well as genetic, immunologic, neurobehavioral, pulmonary, fertility and reproductive, and other effects. Recent modifications have included adding a third dose level to many of the chronic studies. A group of five in vitro short-term cellular and genetic toxicology assays is now incorporated in the prechronic phase of the testing process. For

most of the chemicals entered into the testing process, chemical disposition studies are also included. During FY 1984, 13 two-year studies were completed. During FY 1985, 32 chemicals will be started in the prechronic phase and 20 in the chronic phase of the testing process. A wide variety of chemicals are being tested including selected members of certain chemical classes, especially psoralens, chlorinated dibenzofurans, phthalates, and benzidine and benzidine congener derivative dyes.

4. Testing was completed on 396 chemicals in FY 1984 for mutagenicity. This included 196 completed chemical tests for gene mutations in microbial (Salmonella) systems and 84 completed chemical tests in a mammalion cell system (L51784 mouse lynphoma). Seventy nine chemicals were assayed for their ability to induce chromosome aberrations and sister chromatid exchange in Chinese hamster ovary (CHO) cells in culture. Further, 37 chemicals were tested for their ability to induce sex-linked recessive lethals and heritable translocations in *Drosophila melanogaster*. Chemicals tested were selected largely from those found positive in microbial and/or CHO cells.

Toxicology Methods Development

NIEHS supported research concentrates on the development and validation of sensitive, specific and rapid means for predicting, detecting and characterizing the toxicity of chemical agents in the environment. This research employs basic research findings on effects and mechanisms of toxicity as a basis for the rational development of new and improved test systems. These efforts can be divided into two general categories as follows: (a) developmental and applied research in laboratory animals and *in vitro* systems, as well as the development of analytical chemistry procedures; and, (b) research activities which seek to extend laboratory studies to human risk assessment.

A. Developmental and Applied Research

Major emphasis is placed on developing and validating short-term test systems which will identify, detect, characterize and quantify carcinogenic, mutagenic and teratogenic effects of chemicals and toxic effects of chemicals on target organs, particularly, the nervous, reproductive, pulmonary, digestive, renal, endocrine, and immune systems. Stress is placed on developing biochemical and physiologic markers for the early detection of chemically-induced diseases.

Research studies are conducted in the following areas:

1. In the area of cellular and genetic toxicology, emphasis is placed on developing short-term tests that measure mutagenicity in microbial cells, aneuploidy in microbial and yeast cells, and mutagenicity, cytogenetic damage, and transformation in mammalian cells. *In vivo* tests for germ cell mutations, including the heritable translocation assay and the mouse morphologic and biochemical specific locus tests, are being standardized and validated. Long-term studies will continue with mice and other mammals to develop screening systems capable of detecting mutations over a large number of genes. Several studies continue on developing screening systems for human somatic mutations,

29<

e.g., lymphocytes, and mouse germinal mutations, e.g., sperm, among others; and on identification of biochemical and immunological indicators which can be used for monitoring mutation frequency in humans. Several studies are aimed at improving the primary initial screen for genetic toxicity in Salmonella.

2. In the area of carcinogenesis, a program to assess the utility of rat liver tumor assays for carcinogenic effects via initiation/promotion mechanisms continued. A number of primary mammalian cell culture systems are being evaluated for their sensitivity to detect transformation, and correlate mutagenic with carcinogenic events.

3. In the area of reproductive and developmental toxicology, research seeks to develop better test systems for measuring or predicting infertility, teratogenesis, and genital tract abnormalities in neonatal animals. Studies include the development and validation of an embryo culture system for predicting chemical teratogenesis and identification of biochemical markers such as enzymes which can indicate toxicity during the perinatal and developmental periods. Evaluation of a continuous breeding assay for fertility assessment continued in FY 1984. Two cell culture systems are being evaluated as indicators of teratogenic potential.

4. In the area of neurobehavioral toxicology, methods are being developed to assess neurotoxicity in perinatal and immature animals. Neurochemical methods are being developed which are correlating changes in neuroendocrine and neuropeptide profiles and receptor binding with subtle toxic effects of chemicals. A study continued to develop automated procedures for measuring early neurotoxicity in animals using naturally occurring home cage behaviors, such as spontaneous motor activity and ingestive behaviors.

5. In research in pulmonary and inhalation toxicology, emphasis has been given to detecting and characterizing tissue and blood levels of lung specific enzymes and hormones which may be used as early markers of pulmonary damage by chemicals. New *in vivo* and *in vitro* test systems are being developed to be used as short-term carcinogenesis bioassays.

6. Specific and sensitive tests for chemical toxicity are also being developed in other target organs. A sensitive and reproducible core panel of immunology assays and infectivity models to assess chemically-induced immunotoxicity is being validated. Other research has to do with development of methods for functional analysis and early diagnosis of kidney injury. In general, chemical response profiles are being used to develop test procedures that will permit identification of preclinical exposure to specific environmental substances in human populations.

7. Research in analytical chemistry is focused on improving or developing instrumental and biochemical techniques for separating and measuring toxic chemicals in biological samples, and samples of environmental media, e.g., water, and characterizing metabolites. Particular emphasis has been given to polyhalogenated aromatics. New ultrasensitive and specific techniques such as immunoassays have been developed and applied to identification of potent toxins, e.g., dioxins. State of the art instrumentation is used to achieve high sensitivity and specificity in various analyses.

8. Considerable effort has been given to development of methods for synthesis of organic chemicals of environmental importance and their metabolites, especially halogenated aromatics and polycyclic hydrocarbons.

B. Research Activities Relating to Estimates of Risk in Humans

Research activities include:

1. Quantitative estimation of possible human health effects from exposure to environmental agents based on both epidemiological studies and laboratory studies using techniques such as high-to-low dose carcinogenesis extrapolation. The multi-stage model of carcinogenesis has been used to derive a number of mathematical models for reflecting the independent and dependent effects of two agents or risk factors acting in combination. The methodology for low-dose extrapolation in carcinogenic risk assessment has been modified to deal with experimental endpoints other than carcinogenesis. The experimental designs of the two-year toxicology and carcinogenesis studies have been modified to attempt to provide better low-dose data for extrapolation without adversely affecting the power of the test for detecting carcinogenic effects.
2. Technological surveillance activities which attempt to identify and predict unsuspected existing or potential hazards to man from chemicals of past, present, or future use. The health hazard assessment effort, which interfaces closely with other public agencies as well as the industrial community, examines data and information on existing commercially important chemicals and chemicals which are being developed. This allows identification of knowledge gaps and enables comment on the environmental impact of these agents or on standards and regulations controlling them.

FOOD AND DRUG ADMINISTRATION

Overview

The Food and Drug Administration (FDA) is the principal consumer health protection agency of the Federal government. It is responsible for ensuring that: (1) food is safe and wholesome; (2) biological products such as vaccines, human and veterinary drugs and medical devices are safe and effective; (3) cosmetics are safe; (4) use of radiological products does not result in unsafe or unnecessary exposure to radiation; and (5) all of these products are honestly and informatively labeled. FDA's research program, which is mission oriented, plays an essential role in enabling the Agency to meets it responsibilities for protecting the public health. Toxicology research, the subject of this report, is designed to provide data to strengthen the scientific base for assessing risk or safety and to improve understanding of basic biological and biochemical mechanisms of toxicity. Although the listing of FDA's toxicological research is characterized as method development or testing, programs actually cover a spectrum from basic research at the molecular level to toxicity assessment in the intact animal. The overriding objective of the toxicology research program is to improve the Agency's capability for assessing product safety or risk and to provide as solid a scientific base for making regulatory decisions as the state-of-the-science will support.

Specific areas of research and the range of problems being addressed can best be ascertained from the listing of individual programs.

NATIONAL INSTITUTE FOR OCCUPATIONAL SAFETY AND HEALTH

Overview

The National Institute for Occupational Safety and Health (NIOSH) conducts toxicology research to identify chemicals that may pose hazards to workers. The Institute's toxicology program provides technical assistance to the Occupational Safety and Health Administration (OSHA) and the Mine Safety and Health Administration (MSHA), both in the Department of Labor, and to State health departments. NIOSH also cooperates with other components within the Centers for Disease Control to perform toxicologic studies of public health significance.

Important findings from the Institute's toxicology studies result in three actions. First, information releases are prepared for public dissemination. The principal targets of these releases are workers or their representatives, manufacturers, and users of the chemical under study. Second, the results are used to stimulate industry-wide studies, which involve surveillance and epidemiologic investigation of worker groups. Third, the findings are provided to other government agencies for their use.

NIOSH is mandated under the Occupational Safety and Health Act of 1970 to conduct Health Hazard Evaluations (HHE's) of workplaces. HHE's are performed in response to requests received from workers, their representatives or their employers. Occasionally, HHE's reveal morbidity that cannot be explained with current toxicology information. In response, NIOSH designs toxicologic investigations to elucidate mechanisms of toxicity that may account for the HHE findings.

The toxicology effort at NIOSH is conducted by two Divisions: the Division of Respiratory Disease Studies (DRDS) in Morgantown, West Virginia, and the Division of Biomedical and Behavioral Science (DBBS) in Cincinnati, Ohio. The DRDS concentrates on hazards that cause respiratory ailments such as Coal Workers' Pneumoconiosis, byssinosis, asbestosis, emphysema, industrial bronchitis, and silicosis among coal and metal/non-metal miners, cotton processors, and agricultural workers. The DBBS conducts toxicologic research on problems found in general industry, including agents that pose neurologic, reproductive, carcinogenic, cardiopulmonary, or skin hazards to workers, and toxic interactions between substances that occur together in the workplace.

Basic Toxicology Research

The Institute's program for FY 1985 in toxicology research falls into two broad categories:

- o Studies of Interactions of Toxic Substances--NIOSH has undertaken several investigations that will provide information on the interactions of toxic substances and to more closely approximate conditions experienced by workers at the workplace. These studies involve chemical/chemical, chemical/drug, and chemical/physical agent interactions, such as studies of (a) the effects on neurological functions of combined

33<

exposure to methyl ethyl ketone and acetone, and (b) the cocarcinogenic effects of benzo(a)pyrene in combination with intratracheally administered substitutes for silica sand in the foundry molding process.

- Metabolism/Distribution Studies--The metabolic fate and/or tissue distribution of workplace chemicals is of interest because such important information has a bearing on the etiology of certain occupational diseases. Among the FY 1985 projects are investigations of the biochemical interactions between 1,2-dichloroethane and disulfiram or ethanol, and the biotransformation of glycol ethers and their derivatives.

Toxicologic Testing

The NIOSH program for testing toxic substances, using traditional methods and experimental designs, falls into the following categories:

- Mutagenesis Screening--NIOSH screens occupational chemicals for mutagenic ic properties as a potential forecast of carcinogenesis or genetic disease. Workplace samples are collected from workers and their environment to screen for the presence of mutagens.
- Reproductive Toxicology--Several studies will investigate the effects of various workplace chemicals on fertility and reproduction, with an emphasis on industrial solvents administered by inhalation exposure. Experimental animals of both sexes will be exposed, and effects on fertility and reproduction will be evaluated.
- Carcinogenesis--The carcinogenic, and cocarcinogenic, nature of various workplace substances is being investigated. Of particular interest is the carcinogenicity study of substances actually collected at the workplace and then administered to laboratory animals. Substances under study include roofing asphalts and foundry particulates and effluents.
- Cutaneous Toxicology--Although inhalation is the principal route of workers' exposure to toxic substances, absorption through intact skin is the next most common route. In FY 1981, NIOSH began a research program in cutaneous toxicology with a main interest in quantitatively screening chemicals for their percutaneous absorption properties. This permits recommendations for appropriate protective clothing and work practices.
- Pulmonary Toxicology--The lung is both a target organ for inhaled substances and a major route of entry for systemic intoxication. Because of the high incidence of occupational asthma and its economic impact, NIOSH is evaluating the immune and pulmonary physiologic responses to industrial metals and agricultural dusts.

- Neurobehavioral Toxicology--Human laboratory and workplace studies and those involving experimental animals are investigating the effects of workplace solvents and metals on behavior and associated neurologic function. The animal studies include projects that screen chemicals for their effects on the development and maturation of animals exposed _in utero_.

- General Toxicology Assays--In FY 1985, NIOSH will continue a number of acute, subchronic, and chronic evaluations of workplace substances. These studies will derive dose-response data on the chemicals under test.

Toxicology Methods Development

The underpinnings of any successful program in toxicology are the methods used for toxicity testing. During FY 1985, NIOSH will devote about 20% of its toxicology budget to developing new methods or enhancing existing methods for toxicologic screening of workplace substances. The following areas will comprise methods development activities in FY 1985:

- Mutagenesis--One project will address the development and application of mutagenesis assay systems designed for use at the workplace.

- Reproductive Toxicology-- Several projects will be concerned with the developing improved methods for assessing reproductive hazards. One project will examine the potential use of _Drosophila_ to predict teratogenicity in assay systems. Other projects will examine improved methods for semen analysis; rapid teratogenic screening of chemicals; the use of LDH-, an isozyme of lactic dehydrogenase, as an early indicator of testicular damage; and tests of functional integrity of various organ systems in neonatal animals.

- Neurobehavioral Toxicology--The development of methods appropriate for detecting neurobehavioral effects of workplace chemicals has been underway since FY 1984. In FY 1985, field studies employing these methods will be conducted in structural fumigators.

- Cocarcinogens--A contract effort will evaluate tissue culture methods as a screening technique in the assessment of workplace carcinogens.

NATIONAL EYE INSTITUTE

Clinical evidence indicates that many drugs and chemicals can damage the eye. Of particular concern are the adverse effects of drugs and poisons on the cornea, lens, aqueous outflow channels, retina, and optic nerve. The latter two structures are particularly vulnerable to toxic insult.

The development of sensitive, noninvasive tests of visual function, new animal models of human ocular toxicity, and new tissue culture techniques gives cause for optimism that ocular toxicology, which is presently in its infancy, will develop rapidly and mature over the next few years. At present, most of NEI's support for toxicology is in basic toxicology research. A few projects are concerned with developing methods for evaluating toxicologic effects in the functioning eye and in isolated ocular tissues.

The National Eye Institute has no toxicology testing program *per se*. Although studies of adverse drug reactions are included within broader studies of drug actions and preclinical and clinical trials of chemotherapeutic agents in which toxic effects are monitored are supported, no established test protocols are available; each principal investigator has adopted a system suited to his or her particular research goals and plan. The NEI does not support any studies of toxicology methods development.

Although the National Eye Institute's support of research on ocular toxicity is modest at present, this field has been identified in the 1983 Report of the National Advisory Eye Council, *Vision Research--A National Plan: 1983-1987*, as one of special importance. We expect that the highlighting of research priorities related to ocular toxicity in this report will stimulate interest among vision research scientists in submitting applications for research grants in this field.

36<

NATIONAL HEART, LUNG, AND BLOOD INSTITUTE

Overview

Although the research programs of the National Heart, Lung, and Blood Institute (NHLBI) are not directed primarily towards toxicology research, the toxicity of environmental pollutants, of chemical and biochemical agents, and of therapeutic interventions such as oxygen or drug administration in cardiovascular and pulmonary systems are of great concern. As a result, information relevant to the National Toxicology Program in basic research and in the testing of potentially toxic agents is generated by NHLBI research programs. The following examples are typical of the kind of studies the Institute expects to support in FY 1985.

Basic Toxicology Research

The NHLBI supports studies of the molecular, cellular, and systematic pharmacology of cardiovascular drugs, environmental pollutants, atmospheric gases, trace metals, and potential blood substitutes. The majority of these studies seek to establish, with biochemical, cellular, and animal models, the molecular mechanisms involved in the responses to such agents. Examples include determination of the effects of mutagenic substances derived from the environment, such as tobacco smoke constituents, on metabolism in blood vessel walls, in myocardial cells, in the induction of pulmonary fibrosis, and on cell-mediated immune mechanisms in the pathology of asbestos-induced interstitial pneumonia. Substances such as alkaloids, certain aliphatic amines, and drugs such as adriamycin are being investigated at the cellular level for their effect on myocardial cells. Animal models are being used to investigate the interaction of perfluorochemicals with oncotic agents to determine whether long-term toxic effects occur. Oxygen toxicity in the red blood cell is being investigated with the use of various drugs as biochemical probes. In vitro studies are being conducted to determine the effects of various respiratory environments such as oxygen, helium, neon, and argon, on biochemical processes in pulmonary cells. The effects of industrial pollutants such as isocyanates, carbon monoxide, silica, and asbestos are being investigated at the molecular level with the use of experimental animals. Other drug studies involve the clinical problem of drug-induced lung injury by agents such as bleomycin, imidazolediones, hydantoins, and nitrofurantoin. In addition, there are studies involving organic dusts that may induce hypersensitive pneumonitis in humans.

The Division of Intramural Research through the Laboratory of Chemical Pharmacology and other laboratories has several research projects concerned with drug metabolism at the molecular level, with such compounds as bromobenzene, chloroform, acetaminophen, and various ketones.

Toxicology Testing

Numerous drugs and chemical substances are tested for chemical effects in research supported by the Institute. Potential toxicity secondary to therapy is a major concern in this area as well as the toxicity of inhaled substances. Specific examples include the development and testing of synthetic oxygen-binding iron chelates as well as those derived from hemoglobin. High molecular weight snake venom proteases are being investigated for their property of inactivating human plasma proteinase inhibitors. Ischemic damage to the heart caused by agents thought to have a beneficial effect on oxygen metabolism is being investigated to determine the causes of aberrant metabolism.

NATIONAL INSTITUTE OF ALLERGY AND INFECTIOUS DISEASES

The NIAID continues to be represented as an observer to the Committee to Coordinate Environmental and Related Programs (CCERP) and to be active in the Committee's activities.

It is expected that toxicology related research (basic and testing), sponsored by NIAID in FY 1985, will include both grant and contract-supported research.

The Development and Applications Branch (DAB), Microbiology and Infectious Diseases Program, will support one grant related to basic toxicology research in the area of prodrugs of Ara-A and four contracts to develop antiviral drugs for the treatment of cytomegalovirus infections, particularly in AIDS and other immunosuppressed patients.

In the area of toxicology testing the DAB will support, through six contracts and two grants, research to evaluate drugs for both efficacy and toxicity in animal models of viral diseases. In addition, clinical efficacy and toxicity observations are being made on antiviral compounds.

NATIONAL INSTITUTE OF ARTHRITIS, DIABETES, AND DIGESTIVE AND KIDNEY DISEASES

The NIADDK has research responsibiility for a variety of diseases, including arthritis, musculoskeletal and skin diseases, diabetes mellitus, endocrine and metabolic diseases, digestive diseases, nutritional disorders, kidney and urologic diseases, and blood diseases. Toxicology research is supported by the Institute as a means of better understanding the etiology and pathogenesis of one or more of these disease processes, and how they may be treated.

Analysis of NIADDK's support of "toxicology research" shows involvement primarily in basic toxicology research and toxicology testing, with no funding in toxicology methods development. In basic toxicology research, Institute activity centers around understanding the mechanisms involved in enzyme detoxification systems, and in how substances foreign to the body influence the metabolic balance in its various organ systems. The Institute's projects in toxicology testing consist largely of evaluation of the adverse effects of drugs on such organs and tissues as the liver, the kidneys, bone marrow and the skin, and on the neuroendocrine control system of animals and man.

NATIONAL INSTITUTE OF CHILD HEALTH AND HUMAN DEVELOPMENT

Overview

NICHD supports a wide range of studies involving toxic substances in both intramural and extramural programs. The majority of them are within the category of basic toxicology research with a lesser effort in the testing or methods development areas.

Extramural Programs

Center for Population Research (CPR)

Research sponsored in the Reproductive Sciences Branch (RS) studies: new or more effective means of fertility regulation for use by men and women; funds efforts to understand and ameliorate human infertility; and in the area of reproductive chemistry encourages research for the isolation, purification, determination of structure and synthesis of compounds involved in reproduction. In two other branches a variety of projects for the development and evaluation of contraceptive agents are supported through contracts.

Center for Research for Mothers and Children (CRMC)

In the three branches of the CRMC, there is a continuous interest in research that seeks to understand the effects of toxic substances on the processes of growth, maturation and adaptation in developing organisms from prenatal stages to young adulthood. Concern extends to the women prior to and during pregnancy, and to the behavioral manifestations that may result from contact with noxious agents. Ongoing research examines the toxic and teratogenic effects of pollutants, drugs, and substances frequently used or abused such as caffeine, alcohol and cigarette smoking. Clinical research includes studies on: the neurophysiologic and psychologic consequences of exposure to lead; effects of various components of cigarette smoke on the pregnant woman and her fetus; antibiotics in treatment of prenatal, perinatal and postnatal infections; and the use of chemotherapeutic agents in the treatment of behavior and psychomotor problems in children. Animal studies include research to elucidate mechanisms of abnormal development and of differential sensitivity to cytotoxic drugs, and the induction of cytogenetic abnormalities by chemical agents. In the CRMC, support is provided through grants, program projects and center grants.

41<

Intramural Program

Laboratory of Developmental Pharmacology

Work in this Laboratory centers on the properties of inducible drug metabolizing enzymes. The goal is to understand the genetics of these systems in order to elaborate their role in mutagenesis, teratogenesis, carcinogenesis, and drug toxicity. Currently investigations are directed toward a study of the three gene families controlled by the interaction of various drugs with their receptors. These genes, coding for the P-450 drug metabolizing proteins, have been studied, their gene products isolated, and antibodies to these gene products have been raised. The genes have been sequenced and the flanking regions identified and also sequenced. An understanding of these genes and the manner in wich they are controlled will undoubtedly lead to fundamental knowledge about drug metabolism and toxicity. The interactions of the metabolic pathways controlled by these genes are fundamental to an understanding of the clinical use of these drugs.

Another class of drug metabolizing enzymes, the UDP-glucuronyltransferases, is being studied in a similar way. These enzymes, which serve to render fat soluble materials water soluble and excretable, form a major pathway of drug detoxification in the body. Several of these enzymes have now been purified and antibodies raised against them. The cDNAs for some of these systems have been obtained and work is progressing toward a molecular understanding of this important gene system.

Human Genetics Branch

A portion of the work in this Branch involves applied studies on alcohol toxicity and basic studies on the mechanism of alcohol sensitivity. Previous work has shown that acute administration of alcohol to pregnant monkeys causes drastic changes in fetal-maternal circulation, with consequent limitation of the blood flow and oxygen supply to the fetus.

Studies of a more basic nature deal with the molecular basis of sensitivity to alcohol and the Fetal Alcohol Syndrome. Inspection of the enzyme transketolase, and especially of its affinity for its cofactor, thiamine, have provided a rational basis for considering the thiamine deficiency found in various alcoholic conditions. Preliminary evidence indicates that some alcoholic men and their sons may have a genetic predisposition to thiamine deficiency in the presence of co-existing alcoholism. These findings might relate to some of the complications of alcoholism and to such conditions as the Fetal Alcohol Syndrome.

Developmental Endocrinology Branch

One project undertaken in this Branch concerns the finding of mild feminization in large proportion of Haitian men finding recent refuge in this country. During their initial weeks in placement centers these men developed a pronounced gynecomastia. Branch investigators were consulted by the Center for Disease Control and it was found that the probable cause of this condition was the use of a specific disinfectant in the placement center which contains a putative anti-androgen. The toxicity of this disinfectant was found to reside in its anti-androgen properties; anti-androgens are known to cause gynecomastia in a portion of the men exposed to them.

43<

NATIONAL INSTITUTE OF DENTAL RESEARCH

As the primary sponsor of dental research in the United States, the National Institute of Dental Research (NIDR) maintains responsibility for improving oral health through increased knowledge of oral and dental diseases and disorders. Components of toxicology research, testing, and method development occur in isolated projects supported by the Institute. For example, testing for toxic effects is conducted when screening anti-caries and anti-plaque agents, sugar substitutes, and chemotherapeutic agents used in treating oral herpes; determining the influence of trace elements on tooth structure; or testing the biocompatibility of dental restorative materials. In the area of craniofacial anomalies, the NIDR is exploring the role of environmental agents and genetic factors in oral-facial malformations. Studies are underway to define the molecular basis for genetic predisposition to certain teratogens.

NATIONAL INSTITUTE OF GENERAL MEDICAL SCIENCES

The budget of the National Institute of General Medical Sciences (NIGMS) is devoted almost exclusively to the extramural support of research and research training at universities, medical schools, and similar institutions throughout the country. The NIGMS programs undergird the research areas of the other institutes.

Since the major part of this research is basic and undifferentiated, priority is based on opportunities for major advances in knowledge in a given program area and on the probability that new findings will ultimately contribute to the prevention, diagnosis, or treatment of disease.

Two of the programs in NIGMS which support research that relates to toxicology are the Pharmacological Sciences Program, and the Genetics Program. The NIGMS does not support toxicology testing programs, nor can any of the projects properly be described as toxicology methods development.

Pharmacological Sciences

The research efforts that NIGMS supports in the field of toxicology are characterized by two features, which are that they concern the toxicology of therapeutic drugs and their metabolites, and they are investigator-initiated. Thus, the research is directed toward a wide range of compounds and metabolites which have therapeutic as well as toxic effects on biological systems. The latter group includes a number of venoms, the toxicities of which are poorly understood.

Genetics

The Genetics Program supports research in the areas of DNA repair mechanisms and mutagenesis, which are included under the definition of basic toxicology research. Although most of this research is directed toward gaining an understanding of these processes in normal cells, some investigators also are studying mutant cells and cells from patients with a variety of disorders as a means of understanding the normal and disease processes. For example, some NIGMS grants support investigations on DNA repair in human cells from patients with xeroderma pigmentosum, Fanconi's anemia, Bloom's syndrome, and/or ataxia telangiectasia.

45<

NATIONAL INSTITUTE OF NEUROLOGICAL AND COMMUNICATIVE DISORDERS AND STROKE

Overview

Toxicology research involving environmental chemicals is not one of the main thrusts of NINCDS research efforts. However, areas of neurotoxicology, such as drug-induced adverse reactions, use of toxic chemicals in understanding physiological mechanisms of the nervous system, localization and disposition of substances involved in neurotoxicity and some other related aspects of neurotoxicology, are of prime interest to the National Institute of Neurological and Communicative Disorders and Stroke (NINCDS).

The following is a brief description of activities by subject categories:

Basic Toxicology Research

Studies are being supported on the neurotoxic effects of heavy metals, artificial food colors, synthetic estrogens, kainic acid and some drugs. Particular attention is being given to MPTP, which has proven useful in development of an animal model of Parkinson's disease. The objective of some of these studies is to develop appropriate animal models that will provide information on the basic mechanisms of neurological diseases and their potential therapy. Some research is devoted to synthesis of neurologically active agents, characterization of biologically active peptides in venoms, mode of action of neurotoxicants, analysis of the effects of neurotoxic chemicals on the nervous system, pathogenesis of peripheral neuropathies and modulation of the toxicity by endogenous substances. Some of the studies focus on the localization and disposition of neuroactive elements. Studies are also supported at electron microscopic and cellular levels using high resolution techniques to develop sensitive cytochemical and histochemical information. Some intramural research concerns understanding the suspected brain damaging or teratogenic effects of some lipophilic acids, and their effects are compared with others that are used as food additives, antiseptics and drugs.

Toxicology Testing

NINCDS does not have a toxicology testing program, as such, aimed at routine testing of chemicals in biological systems using standard test protocols. However, the Epilepsy Branch of the Convulsive, Developmental and Neuromuscular Disorders Program conducts a limited toxicology testing of potential anticonvulsant drugs. A number of other studies are focused toward elucidating the underlying mechanisms of toxicity induced by suspected toxic or neurological teratogenic substances. In addition, neuropharmacological studies are directed towards defining neurotoxic side effects of novel therapeutic drugs.

Toxicology Methods Development

NINCDS supports a number of studies which are related to the development of appropriate animal models that are expected to provide information on basic mechanisms of neurological diseases. In this process, animals are exposed to compounds which are believed to produce neurotoxic sequelae resembling certain diseases; the associated biochemical or pathological parameters are monitored.

NATIONAL INSTITUTE ON AGING

The National Institute on Aging does not have programs which as their primary purpose are intended to support studies of toxicology. However, there are elements in its overall program that involve aspects of toxicology; these are principally in basic research. Examples include the aging process, and differential effects of drugs and other chemicals on young adult and aged experimental animals.

47<

NATIONAL LIBRARY OF MEDICINE

The National Library of Medicine (NLM) does not conduct studies in basic toxicology research, testing, or methods development. However, NLM contributes to the Annual Plan of the National Toxicology Program, because many of the activities of the NLM's Toxicology Information Program (TIP) provide an information base in support of research, testing, and method developments related to toxicology.

The TIP was created in 1967 in response to recommendations made by the President's Science Advisory Committee (PSAC) and its Panel on the Handling of Toxicological Information. TIP's objectives are: (1) to create computer-based toxicology data banks from the scientific literature and from the files of collaborating industrial, academic, and governmental organizations, and (2) to establish toxicology information services for the scientific communtiy.

The following online services, available through MEDLARS, the computerized literature retrieval services of the NLM, were developed in response to this mandate:

CHEMLINE (Chemical Dictionary Online), an online, interactive chemical dictionary file, allows users to determine the identity of substances of interest, points to other NLM files containing information about that substance, and aids in further search formulation. CHEMLINE currently contains records for over 610,000 chemical substances.

In FY 1984, the capability to merge names from other NLM files was enhanced, giving users the ability to search for substances under a variety of names taken from the CAS Index Guide, and the NLM RTECS, TDB and MESH files. Additional synonyms taken from the current biomedical literature were added directly to CHEMLINE for the first time this year, and more will be added in the future. In addition, an agreement was reached with The United States Pharmacopeial Convention, Inc., to add U.S. Approved Names (USAN) for drugs to CHEMLINE in FY 1985.

TOXLINE is an extensive, online bibliographic database covering the toxicological literature broadly. Including backfiles, this service now encompasses more than 1.6 million records, covering the period 1965 to the present. References are to published human and animal toxicity studies, effects of environmental chemicals and pollutants, adverse drug reactions, and analytical methodology. TOXLINE, grows at the rate of approximately 140,000 records per year; it contains abstracts and is updated monthly. Efforts are in process to enrich the TOXLINE database with literature citations relevant to hazardous waste issues. Three databases have been evaluated and subsets will be added to TOXLINE in the near future. The three databases are: (1) Hazardous Materials Technical Center Abstract Bulletin, (2) International Labour Organization (Geneva) Bibliographic File on Occupational Safety and Health and, (3) NIOSHTIC, from the National Institute of Occupational Safety and Health.

RTECS (Registry of Toxic Effects of Chemical Substances) is an online, interactive data retrieval service, built and maintained by the National Institute for Occupational Safety and Health (NIOSH). It now contains records for over 67,000 substances. The file covers acute and chronic toxicity data and, where available, contains information about pertinent regulations and exposure standards.

TDB (Toxicology Data Bank) is NLM's major online database describing chemical substances that may be hazardous and have significant human exposure potential. Records in TDB include data on pharmacology and toxicology, manufacturing and use, environmental and occupational exposure, and chemical and physical properties. Data are extracted from tertiary sources such as monographs or handbooks as well as from the primary literature. TDB records are evaluated by the TDB Peer Review Committee, a group of toxicologists associated with the Toxicology Study Section of the NIH Division of Research Grants. The online file presently contains about 4,000 records.

A major expansion of TDB to enhance its utility, primarily in response to DHHS' responsibilities under the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA), continues. The file is being expanded in two ways: (1) more chemical records are being added; and (2) more extensive data coverage is being provided in the areas of environmental effects. The file has been expanded to 135 data elements organized into ten major categories. The plan is to convert the existing TDB records into this larger, more comprehensive file, yet maintain the same degree of quality control.

A new data entry system was developed which permits online, interactive access to TDB records any time during the creation, updating and maintenance stages. Software modules have been implemented to provide (1) computer conferencing for the peer review process, (2) in-process control tracking of all TDB records, and (3) an electronic mail/message sharing capability. A new search and retrieval system for public access to the enhanced file is now being tested.

In FY 1984 more than 700 new chemicals were selected for inclusion in the enhanced TDB. Additional data sources also have been selected, especially for those types of data not extensively available in the present TDB sources. Records now in TDB are being enhanced in accordance with the new format. New records prepared in FY 1985 all will be in the expanded format.

DIRLINE (Directory of Information Resources Online) is an online interactive directory which refers users to resources that can provide information in specific subject areas. Currently the records in DIRLINE come from two sources, the Library of Congress National Referral Center (NRC) database and the National Health Information Clearinghouse (NHIC) database. THE NRC component contains data on 13,621 information resource centers, including public and private organizations, institutions, groups and individuals with specialized information in a particular field. Each record is updated by the NRC at least once every two years. The NHIC database, provided through an agreement with the Office of Disease Prevention and Health Promotion (ODPHP) of the Public Health Service, was added to DIRLINE in June 1984. Initially, ODPHP porvided 428 records, and has agreed to enhance DIRLINE by another 1,000 records in FY 1985. This database contains references to organizations providing information in various areas of health and disease. Each record in NHIC is updated at least once a year. DIRLINE is updated quarterly.

The Toxicology Information Program also provides query response and publication services. Thus, it sponsors the Toxicology Information Response Center (TIRC), which was established at the Oak Ridge National Laboratory some 10 years ago. TIRC's role is to provide literature services in chemical toxicology on a cost-recovery basis in response to requests. Charges for services to participating Federal agencies are recovered through interagency agreements, while charges to others are collected through the National Technical Information Service.

TOX-TIPS (Toxicology Testing-in-Progress), a TIP publication, is a monthly current awareness bulletin containing reports of ongoing or planned toxicity testing of chemicals. The publication, which is sponsored by the DHHS Committee to Coordinate Environmental and Related Programs, results from the cooperative efforts of industrial, Governmental, and academic organiations; however, most of the input now comes from Government sources. The objective of this prompt dissemination of project descriptions is to avoid unnecessary duplication of expensive testing. The publication also includes a literature alerting service concerning new methods for testing chemicals for biological effects. A section on "Alternatives to Animal Testing" is planned for inclusion in FY 1985.

DIVISION OF RESEARCH RESOURCES

Overview

The Division of Research Resources (DRR) provides or improves a research institutional environment or a research resource by supporting the necessary personnel, tools, and/or materials to facilitate the effective conduct of biomedical research. Assurance of optimal utilization of the resource is the responsibility of the institution receiving the grant. The nature of the research must be consonant with the aims of the resource.

Because of the multidisciplinary nature of the Division's programs, it has a major impact on all research supported in the Public Health Service. This can be strikingly seen by the Division's support of toxicology related research where we mirror DHHS support even though we have no program directed toward this objective. By far the largest concentration of our support of toxicology related research is in basic research. We support a modest amount in method development and testing. The impact the programs have in toxicology related research is reflected by the nature of the resource.

Basic Toxicology Research

The Animal Resources Program's research characterizes healthy animal development which can be related to mutagenic, carcinogenic or teratogenic effects of exposure to toxic chemicals whether through the evironment or the adverse effects of drugs. These animals are particularly useful in determining chromosomal aberrations, infertility and behavioral effects due to toxic chemicals.

High voltage electron microscopes, mass spectrometers, nuclear magnetic resonances, and other innovative technologies are supported by the Biotechnology Resource Program. These technologies have a unique impact in the area of toxicology research because structural and conformational studies can be rapidly done using chemical mutagens and carcinogens. The effects of DNA damage and repair and the synergistic interaction between cells and toxic chemicals are well suited to investigation at these national resources.

No program covers all aspects of a scientific area as does the Biomedical Research Support Program. This is due to the fact that awards are made as a percentage of an institution's total NIH support. This mirrors the toxicology related research supported by the NIH. Studies of the toxic effects of chemotherapeutic drugs, whether used for cancer treatment or the treatment of other diseases, and toxic effects of environmental chemicals receive support from this program. Bacterial and viral toxins as well as DNA repair and mutagenesis are also supported. There are several pilot studies on the effects of nutrition or diet on carcinogenesis and mutagenesis.

Research into the safety and efficacy of drugs used for the treatment of numerous diseases is supported by the General Clinical Research Centers Program. Much research is done to determine the biologic effects of these drugs on target organs as well as the disease state. The biological effects of environmental chemicals are seen in exposed patients being treated in the centers. The effects of age related changes to toxicity are also being studied.

Biochemical analyses of toxic chemicals are well suited to investigation through our Minority Biomedical Support Program. Many of the studies involve biochemical effects of carcinogens or mutagens.

Toxicology Testing*

Animal studies are designed to determine the toxic effects of chemicals on target organs and body systems and to characterize their carcinogenic, mutagenic and teratogenic potential. Behavioral anomalies in neonatal primates which result from previous exposure are being investigated. Studies of the structure and conformation of toxic chemicals result in more differentiated screening techniques. *In vivo* and *in vitro* assessment of chemical toxicity receives significant emphasis. Clinical drug trials are being used to assess efficacy and safety of new drugs and those previously considered nontoxic. Clinical trials compare several modes of therapy to determine those which have the most benefit and least toxic effect. Analyses of body fluids for trace metals and other chemicals are being researched as possible detection screens.

Toxicology Method Development*

Researchers are trying to develop new or better plant/animal model systems for extrapolation of research to humans. Techniques are being developed for separating and measuring toxic biological samples. *In vivo* and *in vitro* assays are being developed to detect selected toxic chemicals and determine the mode of action which results in disease and/or adversely affects health status. Statistical models are being developed for air pollutants.

*Tabular information on toxicology testing and toxicology methods development supported by the Division of Research Resources was not available in time for inclusion in the *Review*. For specific information on DRR activities, an agency contact with telephone number is given in the back of the Appendix.

DIVISION OF RESEARCH SERVICES

The Division of Research Services is charged with the primary responsibility of providing scientific and technical support services to the NIH intramural community. These include the provision of veterinary resources, library services, biomedical engineering and instrumentation, and medical arts and photography services. Our mission does not directly relate to toxicology research; however, we have technical support capabilities that might serve the NTP.

The support provided by our Biomedical Engineering and Instrumentation Branch in the field of pharmacokinetics has been an actively used service by many investigators conducting toxicology research.

ALCOHOL, DRUG ABUSE, AND MENTAL HEALTH ADMINISTRATION

Overview

The Alcohol, Drug Abuse, and Mental Health Administration does not administer a formal program of toxicology research. In the areas of mental health and drug abuse, several projects will be initiated or continued which specifically address toxicity of chemical agents whose therapeutic efficacy is being tested. Projects not specifically addressing toxicology issues are not included in this summary since they comprise a considerable portion of the agency's research effort, and to include them would be misleading.

The bulk of the agency's toxicology studies are in the alcoholism area, focusing on the action of alcohol on mental and physical processes. A more complete discussion of this work is included below.

National Institute on Alcohol Abuse and Alcoholism

The alcohol research grants program of the National Institute on Alcohol Abuse and Alcoholism (NIAAA) is devoted to increasing knowledge and understanding of the causes, nature, and methods for prevention of alcohol abuse and alcoholism, and to develop new or improved methods for the treatment and rehabilitation of affected persons. Research supported by the Institute ranges from fundamental studies on the mechanisms of action of alcohol on mental and physical processes to applied research and developmental activities. Research projects sponsored by NIAAA involve the participation of scientists representing all of the psychological, behavioral, and life-science disciplines relevant to the problems of alcohol abuse and alcoholism. The NIAAA supports a wide range of projects, many of which are directly related to toxicology. Projects in this area are all basic research focused on the understanding of the effects and fate of alcohol in biological systems, including modifying factors.

The effects of chronic alcohol use on liver leading to hepatitis and cirrhosis are well documented. Research is ongoing to investigate pathogenic effects of alcohol on the liver, gastrointestional and endoreticular systems, and the treatment of liver disease and and hepatitis. These projects include studies on the impaired immune response, membrane alterations, pharmacokinetics, fibrogenesis, gastric injuries, and impaired gastrointestinal functioning seen in alcoholics, as well as biochemical, physiological, and pathologic studies of liver damage. In addition, the research activities of one of the alcohol research centers are totally dedicated to the study of these pathologies, and several other centers have related component projects. Several RSDA recipients are also doing research in this area.

The toxic effects of both acute and chronic ethanol on the central nervous system (CNS) are also well known. NIAAA-supported projects are investigating a wide range of problems in this area, including the following: neurological and neuropathological sequelae of chronic alcoholism, including adverse effects on neurotransmitters, impairments in memory, cognitive functioning, and sleep patterns, as well as Wernicke-Korsakoff Syndrome and alterations in brain and nerve cell structure; biochemical and physiological changes in the CNS following acute and chronic ethanol administration, especially as they may be related to the phenomena of tolerance, physical dependence, and psychological dependence (craving); and the acute "neurobehavioral" effects of alcohol on learning and memory, cognitive functioning and performance on a psychomotor task (e.g., driving). The final major area of NIAAA-supported research grants related to toxicology is that of the Fetal Alcohol Syndrome (FAS). Recently described in systematic detail, this pattern of birth defects, impaired growth, and mental retardation has been the subject of intense scientific interest. Research support is given both for epidemiological and descriptive studies in humans as well as for more basic studies utilizing animal models of the syndrome.

In addition to these major research efforts, the toxicological effect of alcohol on other organs and systems is being studied by NIAAA grantees. These other systems include the cardiovascular system, muscle, intestine, nutrition, salt, and water homeostasis systems, and endocrine systems, particularly the hypothalamic-pituitary-gonadal axis. Most of these effects have been well-documented in chronic alcoholics, and much of this research is directed at investigating mechanisms of action.

National Institute on Drug Abuse

The goal of the National Institute on Drug Abuse in the area of toxicology research is to develop a knowledge base on the toxicological aspects of abused substances or of drugs intended to be used as treatment drugs in narcotic addict treatment facilities. The chronic toxicity/neurology/behavioral toxicity study with delta-9-tetrahydrocannabinol in rhesus monkeys has been initiated and pilot pharmacokinetic studies are now in progress. Methods have been developed for measuring behavioral changes, assay methodology is being set up and a small component is devoted to the development of a method to administer marijuana smoke to rhesus monkeys. As in the mental health area, no intramural research conducted by the Institute addresses toxicology issues.

National Institute of Mental Health

The National Institute of Mental Health supports research related to the toxic effects of psychoactive drugs in both preclinical and clinical trials. Epidemiological studies and clinical trials to determine both safety and efficacy of drugs used for long periods of time are priority areas. Specifically, studies of lithium and neuroleptics are ongoing. In addition, studies on the effects of drugs on the behavior of offspring exposed in utero (behavioral toxicity) are under way. The long-term objectives of these studies are to provide data for more precise risk/benefit decision making in therapeutics and to discover biochemical mechanisms which produce drug toxicities.

DOE ROLE IN THE SUPPORT OF TOXICOLOGY RESEARCH, TESTING AND METHOD DEVELOPMENT

DEPARTMENT OF ENERGY

Overview

A goal of the Department of Energy (DOE) is to provide future technology options for production of energy. Emphasis is placed on high risk, high long-term pay off technologies which can become attractive to the private sector for commercialization only after research has proved their feasibility. This includes demonstration of environmental acceptability. The latter mandate requires conducting environmental research to establish the Department's goals with minimal or acceptable health and ecological impact. The Office of Health and Environmental Research conducts major research activities devoted to identifying and to understanding the health and environmental problems associated with energy technologies that are under development in the Department.

Long-term biological and environmental research is supported to determine the physical and chemical nature of energy-related emissions, effluents, products and other by-product materials; to identify those agents which are potentially toxic to living organisms; to describe their transport, chemical evolution and fate in the environment; and to understand quantitatively their effects on living organisms including humans. The program ranges from research into the fundamental processes governing chemical interaction in biological systems to research on the dose-effect relationship for differing exposure conditions. Information is developed on acute and chronic biological effects to assure that realistic and appropriate health and environmental protection procedures are established as technology develops. It is also done to enable an early analysis of biological issues in concert with the parallel engineering and economic analyses. Research is also conducted to determine new insights into the mechanisms of biological response, to extend basic knowledge, and to enable understanding biological effects for exposure situations that may not be amenable to direct experimentation (such as effects produced at very low-dose exposure).

Most of the research involved with chemical toxicity is related to potential human health problems encountered in the work place and the environment surrounding facilities required for energy production. The strategy used is to compile all available human data and to conduct a large scale experimental program to provide detailed information that cannot be obtained from human studies.

Most of the chemical toxicology efforts of two divisions of the Office of Health and Environmental Research have been concerned with characterizing energy-related pollutants, products or processes, and understanding the nature of health effects caused by them. For example, research has been conducted on fossil energy processes such as coal combustion, gasification and liquefaction, and production of oil from shale. Other efforts include research on health aspects of particulates such as those from diesel exhaust emissions and new types of insulating materials, and research on metals associated with energy.

DOE research has established: (1) that only a few classes of chemicals that are in complex products, by-products and waste from synthetic fuels account for most of the mutagenic and carcinogenic activity of those mixtures; and (2) that the most potent classes of compounds are similar in all coal gasification and liquefaction processes. High molecular weight, high boiling point, nitrogen-containing polycyclic and heterocyclic aromatic compounds are the most potent components of these complex materials.

Previous DOE research has emphasized mutagenesis and carcinogenesis as crucial delayed toxicological endpoints. In FY 1984 and 1985 increased emphasis is being placed on other systemic toxicological effects.

Also, in FY 1985, the testing of complex materials will undergo the orderly transition from identification of biologically active mixtures to evaluation of individual compounds and classes of chemical mutagens and carcinogens. As these changes occur, the DOE program may produce information that is more related to NTP activities.

Unlike programs of other Federal agencies, representative, energy-related substances from experimental process units have been collected and characterized. Efforts are made to conduct research on substances that are: (1) representative of various processes; (2) most likely to involve human exposure; and (3) provide general knowledge about health effects from a variety of energy-related activities. Other unique features of the DOE program are: (a) tight coupling of analytical chemistry and biological testing, and (b) initiation of integrated, multi-disciplinary programs in interrelated laboratories.

Basic Toxicology Research

Two parts of the Department of Energy toxicology program involve basic aspects of toxicology: (1) the Generic Energy Research Program, and (2) the General Life Sciences Program.

1. The Generic Energy Program includes a variety of studies aimed at understanding the mechanism of action of chemical agents found: (a) to be common to several or all fossil energy technologies (such as emission particles); (b) to be of significant concern in terms of toxicity, mutagenicity; or carcinogenicity; and (c) to be unique to energy and not of major concern to other health-oriented agencies. The research effort includes evaluations of the pharmacokinetics and metabolic transformation of these agents, studies aimed at a basic understanding of how the chemicals react with key biomolecules or receptors and how such reactions lead to health effects.

   The DOE Generic Program continues to be concerned with the toxicological properties of complex chemical mixtures which comprise most of the important materials to which humans might be exposed as a result of energy production and use. This emphasis contrasts with other national programs concerned with evaluation of individual chemical compounds of concern to industry. Since it has become obvious from DOE research that the potency of individual toxic compounds is modified by the presence of other compounds that are components of complex chemical mixtures, future research will be devoted to understanding the kinds of chemical and biological interactions which modify the potency of chemicals in complex chemical mixtures.

2. A portion of the General Life Sciences Program is related to toxicology and probes the most basic mechanisms of biological damage at the cellular, subcellular and molecular level, and how living material copes with such damage (including repair). These studies utilize types of damaging agents that are most appropriate.

Toxicology Testing

The Department of Energy's counterpart of the toxicology testing program of other health-oriented agencies involves epidemiological studies. As mentioned in the overview, every attempt is made to find human populations that might be useful for determining the health effects that could result from exposure of worker groups or the general public to toxic chemicals associated with energy technologies. Although such populations are difficult to find, small studies are under way: (1) with groups exposed to coal combustion effluents in regions where extensive air monitoring has been in place; (2) with worker groups involved in oil shale retorting; and (3) with populations exposed to elevated levels of indoor pollutants from increased weather-proofing of buildings. By far the greatest effort is in experimental approaches designed to provide detailed information about the potential health risk of unproven technologies for which no commercial facilities are operating in this country.

Research is conducted to identify significant health problems and specific classes of chemicals responsible for those problems, and to produce dose-response data in animals for toxicological effects including mutagenesis and carcinogenesis. Much of the basic toxicological research is conducted in university-based laboratories.

Toxicology Methods Development

The Department of Energy supports a limited development program to bring to application reliable short-term *in vivo* and *in vitro* bioassays for identification of hazardous classes of chemicals and specific chemicals in complex materials to which workers or the general population might be exposed during development and operation of various processes for producing or conserving energy.

Some of the effort has evolved from *development* of more test systems to *validation and application* of the existing systems. Some emphasis is placed on quantitation of comparative chemical potency for production of specific effects that the individual systems were designed to reveal.

Major efforts are also placed on research to compare animal and human cell systems. These systems are to be used to develop comparative data for animal cells derived from specific tissues and in overcoming barriers that prevent the use of laboratory-based experimental data for estimating human risk.

EPA ROLE IN THE SUPPORT OF BASIC TOXICOLOGY RESEARCH, TESTING, AND METHODS DEVELOPMENT

ENVIRONMENTAL PROTECTION AGENCY

The United States Environmental Protection Agency (EPA) is the principal Federal agency for identifying and controlling environmental pollutants of air and water, solid waste, pesticides, toxic substances, radiation, and energy. The Agency was created by Reorganization Plan No. 3 of 1970 and brought together fifteen environmental programs which had been dispersed throughout the government. Several offices were added later, including the Office of Toxic Substances.

The responsibilities of the Agency include establishing and enforcing environmental standards, conducting research on the causes, effects, and control of pollutants, coordinating these efforts with other agencies, and assisting state and local governments and industry in the amelioration of environmental problems.

Research is conducted by the Office of Research and Development (ORD) within EPA to provide information to program offices of EPA charged with the responsibility of developing and enforcing environmental standards. The following legislation provides authority for EPA's research and development programs:

- The annual Environmental Research, Development, and Demonstration Act
- Clean Air Act, as amended in 1977 (P.L. 95-95)
- Federal Insecticide, Fungicide, and Rodenticide Act, as amended (P.L. 92-516)
- Federal Water Pollution Control Act (P.L. 95-500), as amended by the Clean Water Act of 1977 (P.L. 95-217)
- Marine Protection, Research and Sanctuaries Act (P.L. 92-532), as amended in March 1974 (P.L. 93-254)
- National Environmental Policy Act (P.L. 91-190), as amended in August 1975
- Public Health Service Act, as amended (P.L. 78-410)
- Resource Conservation and Recovery Act (P.L. 94-580)
- Safe Water Drinking Act (P.L. 93-523), as amended in November 1977
- Toxic Substances Control Act (P.L. 94-469).

The primary means for coordinating of program office needs with the research activities of the Agency are the EPA Research Committees. There are currently five committees, composed of representatives of ORD, program offices, regional offices, and the Office of Policy and Resources Management. They each address a subject area corresponding to the organization and function of the regulatory program offices, as follows:

61<

- Air and Radiation
- Water
- Toxics and Pesticides
- Solid Waste and Emergency Response
- Interdisciplinary

Through the Research Committees, ORD defines and establishes research priorities in response to information needs of the program offices. EPA's research is committed to protecting sensitive environmental systems as well as determining health effects of pollutants. This research is conducted in ORD laboratories located throughout the country, as well as through extramural programs.

Research conducted by the Office of Health Research (OHR) within ORD is aimed at increasing the understanding of human health effects of exposures to multiple pollutants through multiple pathways. OHR conducts research directly in its Health Effects Research Laboratory and funds extramural research through contracts, grants and cooperative agreements. The primary objective of OHR's program, which includes research related to toxicology, is to predict, measure, and determine the significance of human exposure to pollutants in order to provide scientific information for the regulatory program offices. A large portion of OHR's program is directly relevant to the National Toxicology Program of the Department of Health and Human Services and much of the research conducted under the National Toxicology Program by other agencies is utilized by EPA in regulatory decision making.

The National Toxicology Program's (NTP) basic emphasis includes the testing of chemicals that can adversely effect public health and the development and validation of more effective toxicology testing methods. The Environmental Protection Agency (EPA) participates on the NTP Executive Committee, which identifies substances requiring toxicological and carcinogenic evaluation.

EPA research relevant to the National Toxicology Program performed by OHR is discussed in the following sections of this summary under the following headings: (1) Basic Toxicology Research; (2) Toxicology Testing; and 3) Toxicology Methods Development. The primary purpose of EPA's research in toxicology is not to provide basic scientific information, but rather to meet specific regulatory or programmatic needs. Consequently, the majority of EPA's toxicology research efforts that can be classified into NTP's research categories deals with testing of chemicals that can have an adverse effect on public health and with the development and validation of more effective toxicology testing methods.

The Office of Health Research also supports toxicology-related efforts through the Task Force on Environmental Cancer and Heart and Lung Disease. This is not explicitly related to NTP research categories and therefore is not reflected in any of the resource tables. The Task Force, established by the Clean Air Act Amendments of 1977, is mandated to coordinate research among agencies towards clarification of the relationships between environmental exposure to pollutants and cancer, heart, and lung diseases in humans. Currently, efforts are underway to educate health professionals regarding the relationship of environmental factors and human disease. Also, a Workshop on Air Pollutants and Respiratory Cancer is planned for Summer 1985.

EPA is also providing support for the Health Effects Institute, which was established and is funded by EPA and the motor vehicle industry to perform independent research. The goal of the Institute is to produce quality health effects data on mobile source air pollutants, and to develop methods to obtain the needed dose-response data to evaluate the need for regulatory action. This support, like the Task Force, is interdisciplinary in nature and is not reflected in the budget tables.

Basic Toxicology Research

A portion of the Municipal Wastewater Health Research Program is directed towards basic research into the general health effects associated with land disposal of municipal sludge. These efforts first involve a review of current knowledge of the health effects of sludge. Gaps in present knowledge of health effects are being filled with appropriate research using chemical, epidemiological and toxicological approaches. The emphasis will be on heavy metals and organic chemicals that are transmitted from sludge and have the potential to cause adverse health effects. The overall goal of this research effort is to provide data and guidance on the safe disposal of sludge to prevent adverse health effects.

Toxicology Testing

EPA toxicology testing uses test protocols developed both within and outside EPA to provide information on the effects of chemicals in biological systems. Tests on laboratory animals, and in vitro tests on organ and cell cultures, as well as epidemiological studies related to chemical exposure, are included in the program.

Toxicity studies are designed to determine the toxic effects of chemicals on target organs and body systems and to characterize their neurotoxic, immunotoxic, carcinogenic, mutagenic, and teratogenic potential. Studies include the effects of acute and chronic exposure to oxidants, hazardous air pollutants, mobile sources, gaseous and particulate air pollutants, chemical contaminants and constituents of water supplies and drinking water, pesticides, and toxic chemicals.

Toxicological testing of humans and animals exposed to oxidants, such as ozone and nitrogen dioxide, is being conducted to obtain information on a full range of health effects from such exposure. Human clinical studies are directed at describing changes in pulmonary function, biochemistry, and immunology following acute exposure with emphasis on evaluation of these effects in potentially susceptible healthy subpopulations, such as blacks and females. Animal studies are directed at changes in pulmonary structure and blood following chronic and subchronic exposure, with emphasis on very young animals and those with preexisting lung disease. Epidemiological studies of air pollution are primarily directed toward respiratory effects but in some instances assessment of other endpoints such as cardiovascular changes and reproductive effects will be addressed.

63<

A series of studies is being conducted to provide dose-response data on the toxicological effects of hazardous air pollutants, including nickel, lead and other metals, phosgene, and toluene as a surrogate for other volatile organic compounds in neurotoxicology studies. Priority hazardous air pollutants are evaluated in mammalian cell mutagenesis and carcinogenesis bioassays and in animal tumorigenesis studies. Neurotoxicity data of priority hazardous air pollutants are being determined in terms of dose- and time-effect relationships, age-dependent effects, and cross-species comparisons of toxic effects using behavioral, neurophysiological and chemical measurements of structure and function. Data on pulmonary dose-response effects are being obtained from lung deposition studies of radiolabeled phosgene. Pharmacokinetic studies with pulmonary and oral exposure to nickel are also being conducted.

The toxicological effects of mobile source emissions, particularly carbon monoxide, ozone, and unregulated automotive emissions, are the subject of several studies. One study is aimed at determining cardiac responses of normal and at-risk humans (patients with ischemic heart disease) to the inhalation of carbon monoxide and ozone as well as the relationship of carbon monoxide inhalation and the formation of carboxyhemoglobin.

A series of studies is being carried out with various gaseous and particulate pollutants such as SO_x, silica particles, lead, ozone, sulfur dioxide, sulfuric acid, ammonium sulfate, ammonium nitrate, and ammonium nitrite. These studies are directed toward providing data on: the pulmonary, biochemical and immunological effects of gases and particles in normal and asthmatic subjects and in patients with chronic obstructive lung disease; the effects of gases and particles on pulmonary function, morphology, biochemistry and immunology of normal and impaired animals; and the neurobehavioral effects of lead on exposed children and adults.

A study is directed towards determining the carcinogenic, tumor promoting, or other co-carcinogenic effects of Water Quality Criteria chemicals such as silver, organic chloramines, and arsenic.

A series of studies is being conducted to determine various toxicological, carcinogenic, and mutagenic effects of contaminants and disinfectants in drinking water. Chemicals that have been identified in drinking water are screened for carcinogenic, mutagenic and reproductive activity, and chemical toxicities involving liver, kidney, and cardiovascular and central nervous systems are determined. Products used in drinking water distribution systems, such as coal tar, asphaltic-based paint, and coagulants are being tested for carcinogenic, mutagenic, and toxicological properties. Products (and their byproducts) used to disinfect drinking water are being tested for carcinogenic, mutagenic and direct toxicological effects on kidney, liver, and the cardiovascular system as well as for metabolic fate and pharmacokinetic values. The interactive toxicities of volatile organic compounds in drinking water on the cardiovascular system, the liver, and the kidney of the rat are being determined in one study.

For pesticides and toxic substances, legislation places the primary requirement for toxicology testing of new materials on the manufacturer or registrant. Agency research in this area involves special studies of an exploratory nature and testing to validate questionable data. Toxicological studies on pesticides are targeted towards their neurotoxic and teratogenic effects. These projects involve dose- and time-effect studies and include determination of sensitive age groups for setting re-entry standards. In the toxic substances area, testing is carried out on asbestiform minerals.

Toxicology Methods Development

The purposes of toxicology methods development research at EPA includes: development of methods for direct assessment of effects in humans as well as better model systems (cell, tissue, and animal) for extrapolation of research results to humans; assessment of the effectiveness of current health and ecological effects measurement methodologies; validation of proposed toxicology testing methods; and development and validation of predictive mathematical models of the effects of toxicants on animal systems.

The methods encompass a wide variety of health effects in several distinct areas. Health effects include biochemical effects, metabolic studies, organ toxicity, immunotoxicity, neurologic and behavioral toxicity, carcinogenesis, teratogenesis, and genetic and reproductive effects. The areas of interest include air and water quality, drinking water, exposure to gases and particles, oxidants, pesticides, hazardous waste, and toxic substances.

Methods being developed for toxicological effects of oxidants include the development and experimental validation of predictive mathematical models. Of particular concern is the development of theoretical models of respiratory tract deposition of ozone and nitrogen dioxide and the determination of species sensitivity to ozone at equivalent predicted concentrations.

In vivo and *in vitro* methods to identify potentially toxic hazardous air pollutants in ambient air and source emissions are being developed and validated, with emphasis on the quantification of the contribution of specific genotoxicants to the mutagenicity of these sources. Methodologies being developed and evaluated include air sampling methods, chemical and biological extraction methods, and *in vivo/in vitro* bioassays of hazardous air pollutant samples. Methods to permit more sensitive predictive neurobehavioral assays of hazardous air pollutants are also being developed, as are test procedures to evaluate the effects of potential teratogens and reproductive toxins on critical subpopulations such as the peripubertal and the aging animal.

Hazardous air pollutant sampling and bioassay methods are being developed for measuring the genotoxicity and mutagenicity of complex mixtures in indoor microenvironments, as well as from chemicals emitted into the air and/or arising from atmospheric transformation.

Mutagenicity data from the extractable organics from automotive particulate emissions are being evaluated using several statistical methods. This work is being undertaken to develop and validate protocols for bioassay techniques in order to identify unregulated emissions from various engines, fuels, and fuel additives which may present a potential health hazard.

Another series of studies is aimed at developing theoretical models of respiratory tract deposition of SO_2, and development of instrumentation to evaluate human physiological responses to pollutants, such as SO_2 and CO. These studies involve obtaining improved data on regional deposition and physiochemistry for extrapolation of effective pollutant concentrations between animals and man, as well as validation and miniaturization of the Cardiac Exercise Stress Processor for field use.

Short-term biomonitoring techniques are being field tested and validated for water-quality screening for chemical toxicants in waters impacted by complex chemical effluents.

A number of studies are underway to develop methods to bioassay drinking water health hazards, to develop experimental models for distinguishing tumor initiating from tumor promoting chemicals in drinking water, and to provide low-dose extrapolation models. *In vivo* bioassays for drinking water health hazards are being directed primarily to nonvolatile organic material that is not identifiable by gas chromatography or mass spectrometry. Validation of low-dose response extrapolations without large animal populations is achieved by use of preneoplastic responses of tissues to carcinogens of varying types.

Methods are being developed for *in vivo/in vitro* prescreening and toxicological characterization of potentially hazardous wastes (materials regulated under the Resource Conservation and Recovery Act (RCRA) such as raw industrial wastes, leachates, etc.). The goal of this research is to provide a validated pre-screen and toxicological confirmation screen (test battery) to be used to identify and quantify the specific toxic hazard (e.g., acute toxicity, mutagenicity, neurotoxicity, teratogenicity) posed by exposure to specific RCRA materials (raw wastes, leachates). Samples will be characterized and screened in combined *in vivo/in vitro* bioassays. Bioassay screens will include: gross toxicity, carcinogenicity, mutagenicity, neurotoxicity, immunotoxicity, teratogenicity and reproductive effects.

Methods to evaluate the toxicity, mutagenicity, and teratogenicity of pesticides, are being developed. Among other studies, this research includes the development of *in vitro* bioassays for the detection of adverse alterations in developmental and reproductive processes in animals, with particular attention to critical organ function in the neonate. Biochemical and anatomical test systems are applied to identify the principal sites and processes of neurotoxic activity of organophosphate pesticides in order to determine the relationship of indicators of neurotoxicity to disease states and/or behavioral dysfunction. The interspecies significance of teratology test data is being evaluated by a variety of comparisons in order to improve extrapolations of animal test data to human risk.

A final group of studies deals with development of a wide variety of *in vivo*, *in vitro* and *in utero* bioassay methods, structure activity relationship methods, and predictive mathematical extrapolation methods to predict, detect, or measure the toxic effect of various chemical agents. Methods based on an *in vitro* lymphoma assay, gross chromosomal aberrations, and sister chromatid exchanges are being developed to detect the mutagenic effects of toxic chemicals. Alternative reproductive toxicity tests and bioassays to accurately evaluate neonate critical organ function are being developed based on laboratory models that mimic the function to be assayed. Other assays are being developed for genetic toxicity, metabolic toxicity, and neurotoxicity based on *in vivo* and *in vitro* bioassays, ranking methods, germ-cell multi-test systems, interspecies tests, and mutagenicity test batteries. Structure activity relationship methods and scientific databases are being developed to allow prediction of the carcinogenic and mutagenic effects of chemicals based on structural, physiochemical, topographical, mechanistic, and electronic parameters. Finally, the characteristics of molecular electrostatic interaction potentials that may be useful as a premanufacture screen of potentially toxic substances are being identified to determine to what extent these characteristics may be used for that purpose in other more complicated structure activity relationship screens.

67<

TOXICOLOGY METHODS CURRENTLY BEING DEVELOPED BY DHHS, DOE, AND EPA

TOXICOLOGY METHODS DEVELOPMENT

NATIONAL CANCER INSTITUTE

Methods	Area	Abbreviated Summary (Performing Organization and Project No.)
Short-Term - In Vitro		
Transformation of human cells by chemical carcinogens	Carcinogenesis	To dissect the number and kinds of steps involved in carcinogen-induced neoplastic transformation of normal human diploid cells into tumor-forming cells (Michigan State University, R01-CA-21289)
Chemical carcinogen induced neoplastic transformation	Carcinogenesis	To study the *in vitro* induction of neoplastic transformation in human skin keratinocytes by chemical carcinogens (Ohio State University, R01-CA-25907)
Molecular basis of chromosome aberrations	Mutagenesis/ Carcinogenesis	To elucidate the molecular mechanisms of chromosome aberration formation in human cells by the simultaneous monitoring of induction and repair of specific DNA lesions with that of chromosome lesions (University of Texas System Cancer Center, Houston, R01-CA-27931)
Expression of genetic variation in cultured cells	Mutagenesis/ Carcinogenesis	To determine the roles of extramutational events, such as mitotic recombination, gene inactivation, chromosomal rearrangements, deletions or chromosomal segregation, in the expression of recessive mutations in cultured mammalian cells (University of Texas System Cancer Center, Houston, R01-CA-28711)
Carcinogenesis studies in cultured rat esophagus	Carcinogenesis	To develop a cell culture system for the quantitative analysis of the ability of chemical carcinogens to transform rat esophageal epithelial cells and to identify properties that correlate with the onset of transformation and the ability of these cells to produce tumors in syngeneic hosts (Medical College of Ohio, R01-CA-29950)

The contents of this table reflect information available as of August 1984.

TOXICOLOGY METHODS DEVELOPMENT

NATIONAL CANCER INSTITUTE (Continued)

Methods	Area	Abbreviated Summary (Performing Organization and Project No.)
Short-Term - In Vitro (Continued)		
Carcinogen activation by cultured mammary cells	Mutagenesis/ Carcinogenesis	To develop methods to evaluate environmental mammary carcinogens and to define factors and mechanisms related to susceptability to mammary cancer (University of Wisconsin, Madison, R01-CA-28954)
Mutagenesis by metals of environmental significance	Mutagenesis	To develop bacterial short-term bioassay with a genetic endpoint of broad specificity for detecting carcinogenic metal compounds and to extend these studies to a mammalian cell system in order to allow the study of metal compounds that do not enter bacteria (New York University Medical Center, R01-CA-29258)
Mammary mutagenesis assay	Mutagenesis	To develop equivalent human and rat mammary gland in vitro cell systems that will be used for an organ-specific interspecies comparison of the interaction of chemical carcinogens with these cells (University of Wisconsin, R01-CA-30295)
Hydrocarbon activation by human and hamster cells	Mutagenesis/ Carcinogenesis	To compare human and hamster cells as activator cells by using metabolite profiles of polycyclic aromatic hydrocarbons, DNA adduct formation, mutation and transformation as indicators and to compare human and hamster cells as target cells in mutagenesis assays (The Wistar Institute, R01-CA-30446)
Quantitative carcinogenesis in cultured epithelial cells	Carcinogenesis	To use a newly derived mouse epidermal clone 291, selected both for high cloning efficiency and maintenance of terminal differentiation response to Ca++ in an assay designed to more precisely quantitate chemical carcinogen effects in terminally differentiating epithelial cells (New York State Department of Health/Roswell Park Division, R01-CA-31101)

The contents of this table reflect information available as of August 1984.

NATIONAL CANCER INSTITUTE (Continued)

Methods	Area	Abbreviated Summary (Performing Organization and Project No.)
Short-Term - In Vitro (Continued)		
Promotion of chemical carcinogenesis in uterine tissue	Carcinogenesis	To test hypothesis that tumor promotion may be a process of selection using a previously developed *in vitro* cell culture model for the growth and transformation of human endometrial stromal cells (University of North Carolina, R01-CA-31733)
32P-Labeling test for nucleic acid damage by carcinogens	Mutagenesis/ Carcinogenesis	To assess the extent of chemical carcinogen damage to DNA by the postlabeling of nucleic acid digests followed by chromatography as a means of detecting and possibly quantitating carcinogen-DNA damage in animals or man exposed to unknown non-radioactive DNA damaging agents (Baylor College of Medicine, R01-CA-32157)
Mutation in human cells at DNA sequence level	Mutagenesis	To develop methods for the analysis of mutations in human cells at the DNA sequence level (Stanford University, R01-CA-33056)
Promotion and progression of liver cells *in vitro*	Carcinogenesis	To develop an *in vitro* model for tumor promotion utilizing hepatocytes or liver cells derived from carcinogen-treated rats and then promoted in culture by selected hepatic tumor promoters (Purdue Research Foundation, R01-CA-33441)
Tandem gene duplication and carcinogen screening	Mutagenesis	To determine whether chemical carcinogens can induce tandem duplications in *Salmonella* which, if valid, can lead to understanding of molecular events in carcinogenesis and to improve carcinogen screening (Washington State University, R01-CA-33503)
Chemical carcinogens and frame-shift mutation in yeast	Mutagenesis	To study the mechanism and genetic control of frameshift mutagenesis in yeast by the construction of testor strains having +1 G/C and (-1) frameshift mutations (Massachusetts Institute of Technology, R01-CA-34429)

The contents of this table reflect information available as of August 1984.

72

TOXICOLOGY METHODS DEVELOPMENT

NATIONAL CANCER INSTITUTE (Continued)

Methods	Area	Abbreviated Summary (Performing Organization and Project No.)
Short-Term - In Vitro (Continued)		
Chemotherapeutic induction of somatic mutation	Mutagenesis	To explore the feasibility of directing a multiple locus electrophoretic mutation system to analyze the role and impact of somatic cell mutagenesis *in vitro* and *in vivo* on normal human T-cells and in T-cell leukemia-lymphoma (University of Texas System Cancer Center, Houston, R01-CA-34797)
In vitro transformation of epidermal cells	Carcinogenesis	To develop a reliable and quantitative *in vitro* transformation system using mouse epidermal cells from tumor sensitive mice (University of Texas System Cancer Center, Smithville, R01-CA-34890)
Carcinogen-mediated genetic effects	Mutagenesis	To establish a mammalian cell system, derived from Chinese hamster V-79 cells carrying deletion mutations in the cellular thymidine kinase genes and a single copy of the HSV thymidine kinase gene for the analysis of a large variety of genetic effects following exposure to carcinogens and tumor promoters (New York University Medical Center, R01-CA-35631)
Mammalian cell assay for mutagenesis and carcinogenesis	Mutagenesis	To develop a mammalian cell assay for detecting base-substitution and frameshift mutations as well as major DNA rearrangements (University of Cincinnati, R01-CA-36897)
Molecular analysis of carcinogen-induced mutations	Mutagenesis	To determine the types of DNA sequence changes and to characterize host processes that determine the frequency or types of mutations induced in mammalian cells by chemical carcinogens and to identify the primary determinants of sequence specificity in mammalian mutagenesis (University of Wisconsin, Madison, R01-CA-37166)

The contents of this table reflect information available as of August 1984.

TOXICOLOGY METHODS DEVELOPMENT

NATIONAL CANCER INSTITUTE (Continued)

Methods	Area	Abbreviated Summary (Performing Organization and Project No.)
Short-Term - In Vitro (Continued)		
In vivo/in vitro human T-cell environmental mutagenesis	Mutagenesis	To develop a quantitative in vitro assay for measuring the increase in frequency of thioguanine resistant T lymphocytes in humans exposed to environmental mutagens (Michigan State University, R01-CA-37838)
Mechanisms of mutagenesis by aflatoxin and other agents	Mutagenesis	To elucidate how chemical carcinogens cause mutations in bacteria (Boston University, R01-CA-37880)
Cellular hypermutability in cancer promotion	Mutagenesis	To test the hypothesis that induction of mutations in hypermutable cells is a property common to a spectrum of cancer promoters, including agents believed to act through epigenetic mechanisms (Johns Hopkins University School of Medicine, R01-CA-39531)
Short-Term - In Vivo		
Direct mutagenicity testing in humans	Mutagenesis	To develop and validate systems for direct in vivo mutagenicity testing in humans, particularly the thioguanine-resistant peripheral blood lymphocyte variant frequency assay (University of Vermont, R01-CA-30688)
Detection of somatic cell mutations in humans	Mutagenesis	To demonstrate the validity of a cell sorting technique to detect and quantify somatic point mutations in vivo in humans (University of California, Lawrence Livermore National Laboratory, R01-CA-31549)
Monitoring in vivo somatic mutations in animals and humans	Mutagenesis	To develop and validate an in vivo somatic cell mutation assay method, initially in rabbits, that measures the level of base substitution mutation produced in erythroid progenitor cells following exposure to a highly mutagenic agent (University of California, Lawrence Livermore National Laboratory, R01-CA-31714)

The contents of this table reflect information available as of August 1984.

74<

TOXICOLOGY METHODS DEVELOPMENT

NATIONAL INSTITUTE OF ENVIRONMENTAL HEALTH SCIENCES

Methods	Area	Abbreviated Summary (Performing Organization and Project No.)
Extramural Program		
Short-Term		
Use of plant cell culture to study genetic variation	Mutagenesis	Detection system based on hypothesis that, for gene products active as multimeric proteins, it may be possible to isolate mutants whose phenotypes appear to be dominant conditional lethals (University of Utah: R01 ES 1498)
Environmental toxicity expressed in visual dysfunction	Neurobehavioral	Effects on visual function of primates, using techniques of behavioral pharmacology, visual contrast sensitivity, temporal and spatial visuagrams, and visual fields (University of Rochester: R01 ES 1885)
A maize monitor of environmental genotoxins	Mutagenesis	Study of sensitivity of waxy (wx) locus of the angiosperm, *Zea mays*, to known chemical mutagens and carcinogens (University of Illinois: R01 ES 1895)
DNA damage following exposure to genotoxins	Mutagenesis	Develop bioassays capable of determining directly the level of environmentally induced DNA damage *in vivo* (Ohio State University: R01 ES 2388)
Toxic halogenated wastes: *in vitro* bioassay development	Mutagenesis	Develop and validate short-term *in vitro* bioassays for detection and quantitation of toxic halogenated aromatics (Texas A and M University: R01 ES 2937)
Detection of environmental mutagens and antimutagens	Mutagenesis	Extend Ames *Salmonella* tester strains to (1) increase sensitivity and range of detection and (2) apply to pin point classes of mutagens often present in complex mixtures (Johns Hopkins University: R01 ES 3217)

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*Project under the National Toxicology Program
The contents of this table reflect information available as of August 1984.

TOXICOLOGY METHODS DEVELOPMENT

NATIONAL INSTITUTE OF ENVIRONMENTAL HEALTH SCIENCES (Continued)

Methods	Area	Abbreviated Summary (Performing Organization and Project No.)
Extramural Program	(Continued)	
Short-Term	(Continued)	
New analysis of toxicologically altered chromatin	Mutagenesis	Determine whether alterations in murine sperm shape on chromatin structure provide the most useful dosimeter of response to toxic chemicals (South Dakota State University: R01 ES 3339)
Grasshopper neuroblast mutagen test system	Mutagenesis	Study to develop neuroblast of the grasshopper embryo as a rapid mutagen test system (University of Texas Health Science Center, Dallas: R01 ES 3077)
International Program on Chemical Safety (IPCS)	Mutagenesis	Cooperative venture of three UN agencies in part to develop and coordinate toxicity testing on an international level (World Health Organization: U01 ES 2617)
Comparative genetic effects of environmental chemicals	Mutagenesis	Development of mammalian cell culture test systems to obtain comparative mutagenicity data for several classes of compounds in order to understand conflicting system results (American Health Foundation: R01 ES 1724).
Statistical analyses for Environmental health studies	Mutagenesis	Statistically determine optimal design configurations to improve reliability and efficiency of mutagenicity test systems (Montana State University: R23 ES 3254).
Induced mutation in germinal stem cells	Mutagenesis	Evaluate Drosophila ooginial stem cell sex-linked lethal response as means to assess environmental mutagenicities (University of Wisconsin: R01 ES 3263).

The contents of this table reflect information available as of August 1984.

NATIONAL INSTITUTE OF ENVIRONMENTAL HEALTH SCIENCES (Continued)

Methods	Area	Abbreviated Summary (Performing Organization and Project No.)
Intramural Program	(Continued)	
Short-Term	(Continued)	
Development of embryo culture to identify early developmental targets and teratogenic effects of environmental chemicals	Reproductive/ Developmental Toxicity	Involves developing procedures for in vitro growth and differentiation of embryos under more defined conditions. Effects of direct or indirect acting teratogens will be studied (Laboratory of Reproductive and Developmental Toxicology, Z01-ES-70010).
*Fertility assessment using continuous breeding	Reproductive/ Developmental Toxicity	Test system is designed to study effects of subchronic chemical exposures on mating, fertility, and offspring survival and development in mice. Where effects are seen, target organ responses such as change in sperm number or morphology, altered vaginal cytology, or abnormal hormone patters will be measured. Validation will be done with known reproductive toxins and negative controls (Environmental Health Research and Testing, Inc., N01-ES-2-5013; Research Triangle Institute, N01-ES-2-5014)
*Validation of two in vitro cell culture systems for detecting teratogens	Reproductive/ Developmental Toxicity	Inhibition of ascites mouse ovarian tumor cell attachment and human palatal mesenchyme cell growth will be measured in the presence of known teratogens and non-teratogens (Microbiological Associates, N01-ES-38045; Northrop Services, Inc., N01-ES-38046).
*Development of biochemical tests for assessment of chemically-induced pulmonary toxicity	Pulmonary Toxicity	Pulmonary extracellular lining layer of rats and rabbits is sampled by lavage to examine enzymes and other proteins as potential markers of cellular damage (Carcinogenesis and Toxicology Evaluation Branch, Z01-ES-21063).

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*Project under the National Toxicology Program
The contents of this table reflect information available as of August 1984

NATIONAL INSTITUTE OF ENVIRONMENTAL HEALTH SCIENCES (Continued)

Methods	Area	Abbreviated Summary (Performing Organization and Project No.)
Intramural Program	(Continued)	
Short-Term	(Continued)	
*Development of panel of immunology and host resistance assays to assess chemical-induced immunotoxicology	Immunotoxicology	Involves developing, refining and applying methods for measuring delayed hypersensitivity as well as T- and B-lymphocytes, macrophages and bone marrow cell function (Systemic Toxicology Branch, Z01-ES-30106).
*Development and validation of short-term assays to screen chemicals for immunologic toxicity	Immunotoxicology	Involves interlaboratory validation of immunology assays, development of assays measuring host resistance and correlation of the two types of assays (IIT Research Institute, ES-1-5000; Medical College of Virginia, ES-1-5001).
*Developing and evaluating a modified tier approach for studying mutagenic activities of cooked foods, identify the active components, their potency and spectrum of genetic toxicity, and estimate population risk	Mutagenesis	The assay consists of the Ames battery, supplemented by SCE and cultured mammalian cell specific-locus mutation assays. Chemical fractionation of complex mixtures to isolate mutagenic compounds employs chromatographic methods (Lawrence Livermore Laboratory, IAA-Y01-ES-1-0063).
*Development of in vivo test systems to detect mutagen-induced aneuploidy	Mutagenesis	Test is being developed in a yeast, Saccharomyces cerevisiae, and Drosophila spp. for detection of chromosomal aneuploidy, along with gene mutation and recombination (Technische Hochschule, Darmstadt, West Germany, N01-ES-1-5005; University of California (Berkeley), N01-ES-1-5004; Brown University, N01-ES-1-5002).

77<

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*Project under the National Toxicology Program
The contents of this table reflect information available as of August 1984.

NATIONAL INSTITUTE OF ENVIRONMENTAL HEALTH SCIENCES (Continued)

Methods	Area	Abbreviated Summary (Performing Organization and Project No.)
Intramural Program	(Continued)	
Short-Term	(Continued)	
*Evaluation of mouse erythrocyte micronucleus assay as adjunct to rodent toxicity tests	Mutagenesis	Measures increases in frequency of micronucleated erythrocytes in smears of blood from mice exposed to various chemicals; initially, benzene, ethylene dibromide, ethylene oxide, and propylene oxide (U.S. Department of Agriculture, Berkeley, IAA-U01-ES-40113).
*Development of prescreen for clastogenic chemicals	Mutagenesis	Involves investigating causes of bimodal size distribution of trifluorothymidine resistant colonies from control and mutagen treated mouse lymphoma cell cultures for possible correlation of chromosome aberrations and point mutations with small colony formation (SRI International, N01-ES-28038)
Development of improved statistical techniques from laboratory animal data to estimate long-term human risk from carcinogens and teratogens	Carcinogenesis/ Teratogenesis Risk Assessment	Involves evaluation of a variety of statistical and mathematical techniques, ranging from empirical data evaluation and curve fitting to the generation of mathematical models that attempt to approximate biological mechanisms (Statistics and Biomathematics Branch, Z01-ES-41001)
*Test for "genetic drift" in laboratory stocks of Salmonella tester strains	Mutagenesis	As part of a 38 laboratory study, stocks of tester strains are compared with reference strains in response to mutagen, 4-nitroquinoline-N-oxide (Cellular and Genetic Toxicology Branch, Z01-ES-60128)
Quantitative species extrapolation in carcinogenesis	Carcinogenesis/ Risk Assessment	Involves construction of a large-scale computerized data base conforming to a set of acceptability criteria and using animal cancer bioassay data as well as comparison of bioassay data with Salmonella test data (Lawrence Berkeley Laboratory, IAA-222-Y01-ES-10066)

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*Project under the National Toxicology Program
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TOXICOLOGY METHODS DEVELOPMENT

NATIONAL INSTITUTE OF ENVIRONMENTAL HEALTH SCIENCES (Continued)

Methods	Area	Abbreviated Summary (Performing Organization and Project No.)
Intramural Program	(Continued)	
Short-Term	(Continued)	
*Development of a test system to measure initiation/promotion	Carcinogenesis	Liver tumor assays for initiation/promotion will be refined and evaluated for their utility (Argonne National Laboratory, Y01-ES-20091; Litton Bionetics, Inc., N01-ES-35023; University of Wisconsin, N01-ES-35024).
*Development of in vitro assays for studying organ, species, strain and individual variations in activation of chemical carcinogens	Carcinogenesis	S. tymphimurium or V79 cells are cultivated with intact bladder or liver cells or S-9. Cytotoxicity, SCE and mutation induction are measured in V79, and reversion in S. tymphimurium (Cellular and Genetic Toxicology Branch, Z01-ES-21012)
*Validation and application of morphologic specific locus test for heritable mutations	Mutagenesis	Involves testing several environmentally significant chemicals for germ cell mutations in mice, and conducting an in-depth study of germ cell mutations using N-ethyl-N-nitrosourea (Oak Ridge National Laboratory, Y01-ES-1-0067)
*Validation and application of heritable translocation assay for germ cell mutations	Mutagenesis	Six chemicals (likely the same as used with the morphologic specific locus test) will be assessed for chromosome translocation in mice. Control populations will be tested concurrently to build a historical data base (Oak Ridge National Laboratory, Y01-ES-2-0085)
*Evaluation of mammalian cell culture systems for detecting chemical carcinogenesis	Carcinogenesis	Uses primary cell culture from Syrian hamster embryos (SHE) to measure in vitro transformation using the colony transformation endpoint (Argonne National Laboratory, Y01-ES-20102; A.D. Little, Inc., N01-ES-15794; Microbiological Associates, N01-ES-15758).

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*Project under the National Toxicology Program

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TOXICOLOGY METHODS DEVELOPMENT

NATIONAL INSTITUTE OF ENVIRONMENTAL HEALTH SCIENCES (Continued)

Methods	Area	Abbreviated Summary (Performing Organization and Project No.)
Intramural Program	(Continued)	
Short-Term	(Continued)	
*Evaluation of mammalian cell culture systems for detecting chemical carcinogenesis	Carcinogenesis	Uses SHE cells infected with Simian adenovirus to detect enhancement of DNA virus transformation by chemical carcinogens (Microbiological Associates, N01-ES-15795; Northrop Services, N01-ES-15796).
*Evaluation of mammalian cell culture systems for detecting chemical carcinogenesis	Carcinogenesis	Uses retrovirus (type C, RNA tumor virus)-infected rat cells as highly sensitive system to detect transforming ability of chemicals from different chemical classes (Litton Bionetics, Inc., N01-ES-15797; Biotech Research Laboratories, Inc., N01-ES-15807; Northrop Services, N01-ES-15798).
*Evaluation of *in vivo* rodent cytogenetic screening systems	Mutagenesis	Involves developing a protocol for determining frequency of chromosome aberrations and SCEs in rodent bone marrow, testing its utility for detecting carcinogens/mutagens with coded chemicals and comparing with other short-term tests as to relative value (Oak Ridge Associated Universities, Y01-ES-20100; Brookhaven National Laboratory, Y01-ES-20098).
*Develop and validate lab methodology to assess incidence of chromosome aberrations and SCEs in humans	Mutagenesis/ Carcinogenesis	Uses peripheral lymphocytes. Has established a standard protocol, are assessing background incidences of the two endpoints and sources of variability in a study population of about 400 people (Oak Ridge National Laboratory, Y01-ES-20101); Brookhaven National Laboratory, Y01-ES-20099).

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TOXICOLOGY METHODS DEVELOPMENT

NATIONAL INSTITUTE OF ENVIRONMENTAL HEALTH SCIENCES (Continued)

Methods	Area	Abbreviated Summary (Performing Organization and Project No.)
Intramural Program	(Continued)	
Short-Term	(Continued)	
*Develop a short-term test model for assessing effect of chemicals on expression of mononuclear cell leukemia (MNCL)	Carcinogenesis	Establish a MNCL transplant model in mole F344/N rats, and characterize chemically-induced and spontaneous MNCL both morphologically and biochemically (Carcinogenesis and Toxicology Evaluation Branch, Z01-ES-21030).
*Develop in vitro tests for workplace carcinogens	Carcinogenesis	The V79 metabolic cooperativity assay is being further developed and validated as an in vitro assay for tumor promoters (NIOSH, IAA-Y01-ES-20094).
*In vivo determination of absorption, distribution, metabolism and excretion of selected chemicals for use in design and interpretation of chronic toxicity studies	Pharmacokinetics	Involves use of established and development of new analytical techniques for determining the degree of absorption, major tissue depots, clearance rates, degree and type of metabolism and rates and routes of excretion, also involves separation and analysis of major metabolites; (Lovelace Inhalation Toxicology Research Institute, 22Y01-ES-2-0092; Research Triangle Institute,ES-1-5007; and Southern Research Institute, ES-1-5008).
*Evaluation of microencapsulation as a means of incorporating unstable chemicals into rodent feed for toxicology studies	Pharmacokinetics Metabolism	Stabilized preparations of microencapsulated trichloroethylene and 2, 6-xylidine have been prepared and found stable under differing environmental conditions. Bioavailability compared with neat chemical given by gavage is being measured in rats and mice (Carcinogenesis and Toxicology Evaluation Branch, Z01-ES-21078).
Development of new statistical methods and experimental design modifications for carcinogenesis and toxicology chronic studies	Statistical Analysis	Includes use of different mathematical statistical techniques such as mathematical modeling, non-linear optimization, asymptotic information theory, Monte Carlo simulation, and analytical test procedures (Statistics and Biomathematics Branch, Z01-ES-45001).

81

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The contents of this table reflect information available as of August 1984.

TOXICOLOGY METHODS DEVELOPMENT

NATIONAL INSTITUTE OF ENVIRONMENTAL HEALTH SCIENCES (Continued)

Methods	Area	Abbreviated Summary (Performing Organization and Project No.)
Intramural Program	(Continued)	
Short-Term	(Continued)	
*Development of appropriate statistical techniques for analysis of mutagenesis testing data	Statistical Analysis/ Mutagenesis	New methods of design and analysis will reduce percentage of false positive or negative findings in the use and analysis of certain microbial mutagenesis tests, Drosophila, and mammalian cell systems, CHO and L5178Y (Statistics and Biomathematics Branch, Z01-ES-40005).
To improve existing techniques and develop new techniques for statistical analyses of epidemiological studies	Statistical Analysis/ Epidemiology	Uses both theoretical mathematical calculations and computer simulations to assess techniques (Statistics and Biomathematics Branch, Z01-ES-40004).
Development of methods for detecting genetic damage and altered chemical metabolism in human body fluids and tissues for use in studies of environmental epidemiology	Epidemiology	Involves adapting various short-term genetic toxicology assays, and measures of biotransformation to field studies in exposed humans (Epidemiology Branch, Z01-E-43007, Z01-ES-43008).
Development of analytical methodology	Analytical Chemistry	Uses gas-liquid, thin-layer, open column and high pressure liquid chromatography, various types of spectrophotometry, mass spectrometry and isotopic methods to improve recovery, clean up and analysis of various chemicals and classes from biological samples and soil. Special emphasis is on halogenated aromatic compounds, in particular, dioxins and furans (Laboratory of Molecular Biophysics, Z01-ES-30003).

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The contents of this table reflect information available as of August 1984.

NATIONAL INSTITUTE OF ENVIRONMENTAL HEALTH SCIENCES (Continued)

Methods	Area	Abbreviated Summary (Performing Organization and Project No.)
Intramural Program	(Continued)	
Long-Term		
Environmental health applications of mass spectrometry	Analytical Chemistry	Approach involves mass spectrometry using a variety of ion including electron impact, chemical ionization sampling positive or negative ions; and fast atom bombardment to measure and characterize parent compounds and metabolites of chemicals of diverse structure in environmental media or biological tissues and fluids (Laboratory of Molecular Biophysics, Z01-ES-50080).
*To assess utility of respiratory mechanics measurements as indicators of chemical toxicity, and to develop *in vivo* models of mutagenesis	Inhalation Toxicology/ Mutagenesis	Involves exposing rodents chronically to toxic/or carcinogenic aerosols and measuring respiratory mechanics, morphology and clinical pathologic indices as well as detection of *in vivo* mutagenic damage by sister chromatid exchange (Brookhaven National Laboratory, NIEHS-IAA-ES-90043).
Data and Animal Systems		
*Environmental Mutagen Information Center	Mutagenesis	Collects, organizes, stores and disseminates chemical mutagenesis information from the world's literature (Oak Ridge National Laboratory, IAA-Y01-ES-10072).
*Environmental Teratology Information Center	Teratogenesis	Collects, organizes, stores and disseminates chemical teratogenesis information from the world's literature (Oak Ridge National Laboratory, IAA-Y01-ES-10073).
*Development of dioxin registry	Toxicology	Involves development and management of a registry on worldwide human exposures to chlorinated dibenzodioxins (International Agency for Research on Cancer, ES-15009).

83<

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*Project under the National Toxicology Program
The contents of this table reflect information available as of August 1984.

TOXICOLOGY METHODS DEVELOPMENT

FOOD AND DRUG ADMINISTRATION

Methods National Center for Toxicological Research	Area	Abbreviated Summary (Performing Organization and Project No.)
Short-Term - In Vitro		
Develop and modify microbial mutagenesis assays to detect genotoxic chemicals	Mutagenesis/ Carcinogenesis	To utilize well-developed and validated microbial assays (*Salmonella*/Ames) to determine the genetic activity of several metabolites of polycyclic aromatic hydrocarbons, nitroaromatic hydrocarbons, alkylating agents, and aromatic amines (NCTR *275/276)
Develop and modify primary liver cell cultures to determine induced DNA damage and relate that damage to the carcinogenic process	Mutagenesis/ Carcinogenesis	To utilize primary hepatocyte cultures to identify metabolites of precarcinogens and elucidate DNA adducts formed and the rates and extent of repair of these adducts and detect DNA damage using techniques to identify unscheduled DNA synthesis (NCTR *160, *6028/6097)
Develop and modify the CHO/ HGPRT single gene mutation assay to relate alkylation damage to gene mutation and sister chromatid exchange and cytotoxicity	Mutagenesis/ Carcinogenesis	To utilize a well-developed somatic cell system to correlate alkyl DNA adducts to single gene and chromosomal damage (NCTR *160/6029)
Investigate the role of specific oxidative enzymes in arylamine metabolism and carcinogenicity	Carcinogenesis	To use purified enzyme fractions from animals and human liver to determine the relative risk of arylamines (NCTR *6099)
Evaluate the toxicity of clomiphene in rat serum	Biochemical Toxicology	To determine if serum containing clomiphene is toxic in the cultured rat embryo system and assess comparative toxicity of serum containing clomiphene in rat, monkey, and man (NCTR * 6044)

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FOOD AND DRUG ADMINISTRATION (Continued)

Methods	Area	Abbreviated Summary (Performing Organization and Project No.)
National Center for Toxicological Research	(Continued)	
Short-Term - In Vitro/In Vivo		
Development of various methods for evaluation of DNA excision repair capacity between species using both tissue culture and animals	Mutagenesis/ Carcinogenesis	To evaluate DNA excision repair between species in order to be able to extrapolate knowledge learned to human health risk (NCTR *6087)
Measurement of transport of carcinogenic nitrated aryl compounds across the placenta and mammary tissue	Carcinogenesis	To determine if 1-nitropyrene or its metabolites are transported across the murine placenta or mammary tissue into the fetus or neonate, respectively.
To study metabolic activation of arylhydroxamic acids and aromatic amines by rat Zymbal gland	Carcinogenesis	To determine the enzymatic pathways responsible for activation of aromatic amines and amides by a tissue susceptible to chemical carcinogenesis (Project will be completed FY 1985) (NCTR *6124)
Measurement of DNA damage and persistence by N-hydroxy-N-formyl-2-aminofluorene in rat mammary tissue	Carcinogenesis	To understand the type of DNA adduct responsible for mammary gland carcinogenesis (Project will be completed FY 1985) (NCTR *6125)
Short-Term		
The effect of lead in conformation and biological activity of calmodulin	Chemistry/ Mutagenesis	To assess whether binding of Pb^{2+} ions to calmodulin results in conformation changes and an alteration in the biological activity of calmodulin (NCTR *6085)
Effects of aminopyrene on mechanism of 1-nitropyrene mutagenicity	Mutagenesis	To investigate the mechanism of 1-nitropyrene mutagenicity, an aminopyrene derivative will be used (NCTR *275)

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The contents of this table reflect information available as of August 1984.

FOOD AND DRUG ADMINISTRATION (Continued)

Methods National Center for Toxicological Research	Area (Continued)	Abbreviated Summary (Performing Organization and Project No.)
Short-Term		
Structural modifications of synthetic nucleic acids by chemical carcinogens as studied by nuclear magnetic resonance spectroscopy	Chemistry/ Carcinogenesis	To determine the structural consequences of in vitro reactions of chemical carcinogens with oligonucleotides and self-complementary duplexes; and to develop NMR spectroscopy methods for this purpose (NCTR *6012)
Studies on effects of adducts on DNA structure	Carcinogenesis/ Chemistry	To study effects of adducts on DNA structure; selected polycyclic aromatic hydrocarbons were synthesized (NCTR *6012, 6048/6148)
Covalent DNA binding studies	Carcinogenesis	To investigate the nature of covalent binding to in vitro and in vivo DNA. A final report on an earlier study (EXP 073) has been completed (NCTR *6029, 159, 6055/416/284/351)
Studies on effect on covalent binding of N-hydroxy-2-AAF to DNA	Carcinogenesis	To investigate chemicals as to their effect on covalent binding of N-hydroxy-2-acetylaminofluorene to DNA (NCTR *6094/416)
Isolation and characterization of DNA-bound products	Carcinogenesis	To obtain reference compounds, DNA-bound products were isolated, characterized and/or synthesized (NCTR *6029, 159)
Studies to investigate induction of neoplasia	Carcinogenesis	To investigate mechanisms as to how primary arylamine compounds induce neoplasia (NCTR *159)
Effects of chemicals on "urinary physiology"	Carcinogenesis	To investigate effects of chemicals on "urinary physiology" and relationship to carcinogenesis (NCTR *318)
Acetyltransferase catalyzed binding to DNA	Carcinogenesis	To study acetyltransferase catalyzed binding of arylamides to DNA. A final report on earlier studies (EXP 136/158) has been completed (NCTR *186/6125/6124)

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The contents of this table reflect information available as of August 1984.

TOXICOLOGY METHODS DEVELOPMENT

FOOD AND DRUG ADMINISTRATION (Continued)

Methods	Area	Abbreviated Summary (Performing Organization and Project No.)
National Center for Toxicological Research	(Continued)	
Short-Term	(Continued)	
Immunological assays development	Carcinogenesis	To develop immunological assays for arylamine DNA adducts (NCTR #159)
Correlation of blood cholinesterase levels with toxicity of agent GB in CD rats	Short-Term Method	To correlate the pseudocholinesterase levels in blood with toxicity indicators on an individual animal basis (NCTR #6247)
Role of hepatic blood flow in the cholestatic actions of estradiol-17B-D-glucuronide in the rat	Short-Term Method	To determine if the decrease in bile flow observed following estradiol-17B-D-glucuronide ($E_2$17G) administration is related to a coincident decrease in hepatic blood flow
*Development of analytical procedures for the analysis of six antihistamines and metabolites in laboratory animals	Analytical Chemistry	Methods development completed for trace level analysis of doxylamine, pyrilamine, methapyrilene, thenyldiamine, tripelennamine, and chlorothen in animal feed, human urine and wastewater as prerequisites for bioassay tests. Methods development is underway for metabolites (NCTR #6039)
High-field NMR for structural analysis of polycyclic aromatic hydrocarbons, aromatic amines and natural products	Analytical Chemistry	To determine applicability of combining high-field NMR spectroscopy measurements with resolution enhancement techniques and with low sample temperatures for structural and conformational analysis of polycyclic aromatic hydrocarbons, aromatic amines and natural products
Examination of liver for basophilic foci after dosing of neonates with gentian violet	Carcinogenesis	To investigate the utility of newborn mouse assay for short-term carcinogenesis work when coupled with early histological events (NCTR #6121)

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The contents of this table reflect information available as of August 1984.

88

TOXICOLOGY METHODS DEVELOPMENT

FOOD AND DRUG ADMINISTRATION (Continued)

Methods	Area	Abbreviated Summary (Performing Organization and Project No.)
National Center for Toxicological Research	(Continued)	
Short-Term	(Continued)	
Evaluation of newborn mouse assay	Carcinogenesis	Determine if estrogens promote carcinogenesis in newborn mice initiated with a known carcinogen (2-AAF)(NCTR #392)
Develop and refine the biochemical specific locus assay to detect a broad spectrum of genetic damage	Mutagenesis	To expand the number of genetic loci assessed, to decrease the false positives, and to increase our sensitivity by decreasing the CY of enzymes assessed (6080, 6093, 6122)
Ultrastructural analysis of saccharin effects on neonatal rat bladder	Pathology	To examine by electron microscopy the neonatal rat bladder for dose dependent micropathology resulting from exposure to sodium saccharin _in utero_ (NCTR #417)
*Development of analytical procedures for the analysis of the metabolite (hippuric acid) of cinnamaldehyde	Analytical Chemistry	To develop methods for the analysis of hippuric acid in the urine of rats that have been on feed dosed with encapsulated cinnamaldehyde. This research has been completed although additional work is scheduled for metabolites identification (NCTR # 5749)
*Development of analytical procedures for the analysis of triprolidine and metabolites	Analytical Chemistry	To develop methods for the trace analysis of triprolidine in animal feed, human urine, and wastewater, as prerequisites for bioassay tests and pursue methods development for metabolite identification (NCTR #6039)
Development of analytical procedures for the analysis of penicillamine and triethylene tetramine	Analytical Chemistry	To develop methods for the trace analysis of penicillamine and triethylene tetramine in animal feed, human urine, and wastewater as prerequisites for bioassay tests (NCTR #5745)

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TOXICOLOGY METHODS DEVELOPMENT

FOOD AND DRUG ADMINISTRATION (Continued)

Methods	Area	Abbreviated Summary (Performing Organization and Project No.)
National Center for Toxicological Research	(Continued)	
Short-Term	(Continued)	
Preparation and mutagenicity testing of triazenes derived from interaction of sulfonamide drugs and nitrite	Mutagenesis/ Carcinogenesis	To apply the CHO/HGPRT single gene mutation assay to likely metabolites from gastric interaction of sulfonamide drugs with nitrite (NCTR #6149)
Effect of chemical structure on carcinogenic response to N-hydroxy N-acyl-2-aminofluorenes in rats _in vivo_	Carcinogenesis	To determine if modification of acyl groups will alter the carcinogenic response and to correlate that effect to activation by various enzymatic activation pathways (NCTR #186)
A study of the effects of ethylene dibromide (EDB) on the glutathione system of the male rat reproductive tract	Mutagenesis	The objective is to investigate the effect of multiple doses of EDB on several parameters of male reproductive function including glutathione (GSH) levels, GSH S-transferase specific activity and sperm viability (NCTR #6314)
Photochemical activation of environmental toxicants	Mutagenesis	To investigate the biological consequences of exposing various environmental toxicants to light. The principal toxicants to be assayed are the polycyclic aromatic hydrocarbons and their nitro-substituted derivatives (NCTR #6237)
Mass Spectrometry of nitro-PAHs	Analytical Chemistry	Investigation of the mass spectrometry of nitro-PAHs and other substituted PAHs (NCTR #6234, #6290)
*Study structure-activity effects in rats and mice on acute/subchronic toxicological endpoints	Carcinogenesis/ Chemical Toxicology	To study the structure/activity relationships for a series of antihistamines to determine the degree of and similarity between toxicology endpoints, including neoplastic disease

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The contents of this table reflect information available as of August 1984.

FOOD AND DRUG ADMINISTRATION (Continued)

Methods	Area	Abbreviated Summary (Performing Organization and Project No.)
National Center for Toxicological Research	(Continued)	
Pharmacokinetics/Metabolism		
Synthesis and quantitation of metabolites and DNA adducts in vitro, in Salmonella typhimurium, and in Chinese hamster ovary cells exposed to dinitrated pyrenes	Chemistry/Metabolism	To determine if mammalian enzymes and classical nitroreductases will metabolize dinitropyrenes to products capable of binding to DNA and causing mutations (NCTR #6187)
Reductive metabolism by purified cytochrome P-450 reductase	Metabolism	To assess the importance of reduction in the metabolism of acetaminophen, gentian violet, 1-nitropyrene and CCNU (NCTR #6232)
*Stereoselective metabolism of doxylamine	Metabolism	To determine the importance of stereoselectivity in the metabolism of doxylamine (NCTR #6235)
*To study the hepatic microsomal metabolism of doxylamine	Pharmacokinetics/ Metabolism	To isolate and characterize the hepatic microsomal metabolites of doxylamine and to determine if one enantiomer is metabolized differently from the other enantiomer (NCTR #6235)
Extrapolation of animal data to man	Teratogenesis/ Pharmacokinetics/ Metabolism	To test the ability of pharmacokinetics to predict toxicological events in an individual animal, within a strain, across strains, and across species (NCTR #069)
Polycyclic aromatic hydrocarbon, nitroaromatic hydrocarbons, and aromatic amine studies	Pharmacokinetics/ Metabolism/Mutagenesis/ Carcinogenesis	Polycyclic aromatic hydrocarbons and amines were synthesized to study in vitro metabolism and/or mutagenicity and carcinogenicity (NCTR #275 and 276)
Activation and deactivation of amino azo dyes	Pharmacokinetics/ Metabolism	To investigate the activation and detoxification of amino-azo dyes. A comparative metabolic class study is performed (NCTR #210)

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TOXICOLOGY METHODS DEVELOPMENT

FOOD AND DRUG ADMINISTRATION (Continued)

Methods National Center for Toxicological Research	Area (Continued)	Abbreviated Summary (Performing Organization and Project No.)
Pharmacokinetics/Metabolism		
In vitro and in vivo metabolism studies of structurally related compounds	Pharmacokinetics/ Metabolism	To investigate use of established and development of new analytical techniques for determining degree of absorption, tissue depots, clearance rate, degree and type of metabolism and rates and route of metabolism (NCTR #391, 6082, 259, 6005)
Studies on the toxicity and metabolism of phenacetin and acetaminophen	Pharmacokinetics/ Metabolism/Mutagenesis/ System/Organ Toxicity	To study mechanism of metabolism of phenacetin and acetaminophen as it relates to their toxicities (NCTR #6098)
*In vitro and in vivo metabolism studies with gentian violet	Pharmacokinetics/ Metabolism	To study in a comparative manner the in vivo metabolism of gentian violet and to develop useful in vitro assays. Total residues are measured in tissues and metabolites are identified in vivo (NCTR #302, 303, 6040)
*In vitro and in vivo metabolism studies with sulfamethazine	Pharmacokinetics/ Metabolism	To study in a comparative manner the in vivo metabolism of sulfamethazine and to develop useful in vitro assays. Total residues are measured in tissues for different chronic doses. (NCTR #347, 348)
Pharmacokinetic modeling	Biometry/ Pharmacokinetics	Evaluate the usefulness, limitations, and advantages of Michaelis-Menten kinetics in pharmacokinetic modeling (NCTR #6072)
Develop a system for direct fetal and maternal blood sampling over time	Teratogenesis/ Pharmacokinetics/ Metabolism	Develop a chronic indwelling catheter system in non-human primates that will allow repeated direct fetal and maternal blood sampling over time for assessment of chemical placental transfer, pharmacokinetics and metabolism (NCTR #6089)

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TOXICOLOGY METHODS DEVELOPMENT

FOOD AND DRUG ADMINISTRATION (Continued)

Methods	Area	Abbreviated Summary (Performing Organization and Project No.)
National Center for Toxicological Research	(Continued)	
Immunotoxicology		
Effect of toxic compounds on developing immune systems	Immunotoxicology	To determine if the administration of phenytoin to BALB/c mice during immune ontogenesis will result in postnatal immune dysfunction. To characterize the immune dysfunction if it is produced in terms of: a) the relation of dosage and time of administration of phenytoin to the degree and type of immunologic abnormality produced; and b) the persistence of the immunologic defect in the offspring. To determine if the administration of phenytoin to fetal and neonatal mice will produce an increased incidence of neoplastic disease (NCTR *272)
Lindane immunotoxicology study	Immunotoxicology	To determine the effect of lindane on immunocompetence. Determine the possible effect of genotype and phenotype on the response to T-dependent and T-independent antigen and the susceptibility to lindane-mediated immunotoxicity. Develop preliminary data regarding ability of relatively non-invasive measures of immune function to predict which animals will later develop tumors (NCTR *189)
Impaired host-resistance as a consequence of exposure to toxic chemicals	Immunotoxicology	To develop and apply host-resistance models using increased susceptibility to infection with selected bacterial, viral and protozoan agents to evaluate toxicant suppression of protective immunity. Investigate the ability of host-resistance models to detect changes in functional immunity at toxicant doses which do not cause over-manifestation of toxicity. Utilize alterations in pathogenesis and in the acquisition of immunity to characterize toxicant-induced lesions (NCTR *6147)

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TOXICOLOGY METHODS DEVELOPMENT

FOOD AND DRUG ADMINISTRATION (Continued)

Methods	Area	Abbreviated Summary (Performing Organization and Project No.)
National Center for Toxicological Research (Continued) Reproductive/Developmental Toxicity		
Prenatal induction of hypertensions	Teratogenesis Reproductive/ Developmental Toxicity	To determine whether prenatal exposure to chemicals will predispose rat offspring to increased blood pressure (NCTR *156)
Conventional teratology and test methodology	Teratogenesis Reproductive/ Developmental Toxicity	To conduct studies in conventional teratology to clarify areas where there is a paucity of information or conflicting data in the literature and to develop new and improved procedures for conventional teratology testing (NCTR *190)
Comparison of two fetal evaluation techniques and their ability to detect malformations	Teratogenesis/ Reproductive/ Developmental Toxicology	To determine whether there is a difference in the abilities of the Wilson and Staples techniques to detect existing malformations of the heart and diaphragm in rat fetuses (NCTR *6163)
Range-finding study of propranolol dose levels and schedule of administration	Reproductive/ Developmental Toxicity	To provide background information on maternal and fetotoxicity in the rat resulting from prenatal propranolol treatment (NCTR *6081)
Salicylic acid pharmacokinetic/teratology study	Pharmacokinetics/ Metabolism	To compare the pharmacokinetic and teratogenic parameters after iv administration on day 10 or day 11 of gestation of 375 mg/kg salicylic acid to CD rats (NCTR *6179)
Comparison of metabolism and disposition of dexamethasone and cortisol in the pregnant Rhesus monkey	Pharmacokinetics/ Metabolism	To determine the metabolic fate of dexamethasone in pregnant Rhesus monkeys and to compare the metabolism and distribution with cortisol (NCTR *6190)

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TOXICOLOGY METHODS DEVELOPMENT

FOOD AND DRUG ADMINISTRATION (Continued)

Methods	Area	Abbreviated Summary (Performing Organization and Project No.)
National Center for Toxicological Research	(Continued)	
Reproductive/Developmental Toxicity	(Continued)	
Influence of S-9 microsomes plus co-factors on cyclophosphamide teratogenicity *in vitro*	Short-Term Method In Vitro	To develop the technique for culturing day 10 rat embryos in rat serum to which S-9 microsomal fraction, cofactors, and cyclophosphamide have been added (NCTR *6209)
Study of the hormonal control of drug metabolizing enzyme development in rats and monkeys	Biochemical/Cellular/ Tissue Effects	To study the hormonal control of hepatic drug metabolizing enzyme development in the rat pups fed by continuous intragastric infusion, and to study the effect of glucocorticoids on drug metabolizing enzyme development in rhesus monkeys (NCTR *6124)
Characterization of catecholaminergically-mediated changes in the swimming immobilization response in developing rats	Neurologic/Behavioral Toxicity	To examine ontogenetic changes in pharmacologically mediated effects upon the immobilization response (NCTR *6231)

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TOXICOLOGY METHODS DEVELOPMENT

FOOD AND DRUG ADMINISTRATION (Continued)

Methods	Area	Abbreviated Summary (Performing Organization and Project No.)
National Center for Toxicological Research	(Continued)	
Biochemical/Cellular Tissue Effects		
Evaluation of the interaction of estradiol and related compounds	Teratogenesis Biochemical/ Cellular/Tissue Effects	To develop methods that can be used to characterize the binding and cellular activity of estrogens in the fetal rat uterus (NCTR #170)
The development and implementation of sucrose density gradient sedimentation techniques for the identification of the cellular retinoic acid binding protein in embryonic mouse limb bud	Biochemical/Cellular/ Tissue Effects	To develop laboratory procedures in sucrose density gradient sedimentation for the identification of the specific cellular retinoic acid binding protein (CRABP) by using testes from young male CD rats and the embryonic mouse limb bud as sources of CRABP (NCTR #6241)
Effect of trimethyltin on regional neurotransmitter levels and receptor binding in mouse brain	Biochemical/Cellular/ Tissue Effects	To determine the effects of acute administration of trimethyltin on neurotransmitters and high affinity receptor binding in different regions of the mouse brain (NCTR #6265)
Postnatal ontogeny of estrogen binding sites	Biochemical/Cellular/ Tissue Effects	To determine if the morphological alterations and toxicological sequelae induced by estrogen administration will be correlated with continuously elevated levels of nuclear estrogen binders during the dosing period (NCTR #6065)
Biochemical parameters of detoxification mechanisms	Biochemical/Cellular Tissue Effects	Determine baseline values for hepatic glutathione concentration, hepatic cytochrome P-450, and glutathione S-transferase activity and serum v-glutamyl transpeptidase activity in NCTR inbred mouse strains (NCTR #6109)

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The contents of this table reflect information available as of August 1984.

95<

TOXICOLOGY METHODS DEVELOPMENT

FOOD AND DRUG ADMINISTRATION (Continued)

Methods	Area	Abbreviated Summary (Performing Organization and Project No.)
National Center for Toxicological Research	(Continued)	
Biochemical/Cellular Tissue Effects	(Continued)	
Automated detection and interpretation of blood pressure data related to hypertension in rats	Cell Biology/ Teratology	To modify existing hypertension equipment so that blood pressure data may be obtained automatically (NCTR *156 and 6081)
Effects of isoproterenol and sodium phenobarbital on DNA replication, nuclear protein synthesis and cell ultrastructure in the (C3H x VY) F-1 hybrid mouse	Cell Biology/ Acute/Chronic Pathology	Perfect experimental and statistical techniques for use in investigating effects of chronic phenobarbital exposure in mice displaying two different levels of susceptibility to hepatocarcinoma. The acute studies proposed here will define proper electrophoretic extraction procedures and flow data information essential to studies on chronically-exposed animals (NCTR *6184)
Interfacing the PDP 11/34 laboratory computer to the fluorescence activated cell sorter height analyzer for storage and analysis of flow cytometric data	Cell Biology	Design interface system following evaluation of existing equipment and determination of required modifications for compatibility, purchase hardware, and cables, fabricate interface system, develop software (NCTR *6175)
Effects of saccharin on fetal bladder	Biochemical/ Cellular Tissue	To determine the effects of in utero saccharin exposure on mitotic index and epithelial morphology (NCTR *417)
The use of the O'Farrell two-dimensional electrophoresis technique for the detection of biochemical alterations from toxic chemicals in homogeneous populations of in vivo mammalian nuclei	Cell Biology	Homogeneous nuclear populations, collected from specific regions of the cell cycle, and in non-dividing cells are used as sources of proteins that possibly manifest aberrant metabolic changes before toxic insult is clinically evident (NCTR *6100)

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*Project under the National Toxicology Program

The contents of this table reflect information available as of August 1984.

TOXICOLOGY METHODS DEVELOPMENT

FOOD AND DRUG ADMINISTRATION (Continued)

Methods	Area	Abbreviated Summary (Performing Organization and Project No.)
National Center for Toxicological Research	(Continued)	
Biochemical/Cellular/Tissue Effects	(Continued)	
Evaluation of flow cytometric cell cycle data on cultured murine splenocytes exposed to selected chemical agents	Cell Biology	Determination of the statistical probability that the cell cycling of stimulated murine splenocytes *in vitro* has been perturbed by treatment with selected toxicants (NCTR *6174)
Cell cycle analysis and isolation of the different ploidy groups of the normal and regenerating rat liver	Cell Biology	To determine which cells of the different ploidy groups in the mammalian liver are important in liver regeneration and to isolate those cells for further biochemical analysis (NCTR *6261)
Fidelity of DNA replication of regenerating liver chromatin from aging mice	Biochemical/Cellular Effects	To determine if the accuracy of DNA replication in proliferating cells decreases in aging organisms (NCTR *6248)
Saccharin effects on genetic damage in transformed fibroblasts	Carcinogenesis	Determine if saccharin alters the number or persistence of carcinogen-DNA adducts or strand breaks in DNA (NCTR *6229)
Separation of isolated hepatocytes into subpopulations of cells from specific zones of the liver acinus	Biochemical/Cellular/Effects	To investigate flow cytometric techniques to isolate enriched or pure subpopulations of viable hepatocytes of periportal or pericentral origin (NCTR *6249)

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TOXICOLOGY METHODS DEVELOPMENT

FOOD AND DRUG ADMINISTRATION (Continued)

Methods	Area	Abbreviated Summary (Performing Organization and Project No.)
National Center for Toxicological Research	(Continued)	
Acute/Chronic Toxicity		
*Gentian violet, and sulfamethazine studies	Acute/Chronic	To conduct research to determine the oncogenic, teratogenic, and toxicological characterization of these chemicals (NCTR #278/279/302/304/338/354/355/333/334/347/348/418/419/421/422/423/420)
Controlled genetic variation in subchronic and chronic toxicity assays	Carcinogenesis	To provide more comprehensive risk assessment by determining the variability of risk estimates by using several F-1 hybrids rather than a single F-1 hybrid and without increasing the total number of test animals used (NCTR #328)
Development of a more sensitive in vivo assay to detect carcinogenic potential of low dose levels of chemicals	Carcinogenesis	To compare the time-to-appearance of palpable mammary gland lesions in two closely related mouse genotypes treated with a low dose of a known carcinogen (NCTR #247)
Improvement of chronic toxicity assay of hypocholesterolemic, hypolipidemic drugs	Carcinogenesis	To compare the incidence of hyperplastic and neoplastic lesions induced by hypolipidemic drugs under different in vivo metabolic conditions (NCTR #350/246/349/401-403)
Evaluation of DNA excision repair between species	Carcinogenesis	To evaluate DNA repair factors with regard to the extrapolation of animal data to man (NCTR #6087)
Bioassay to determine the effects of interaction of aflatoxin and ammonium hydroxide in four different diets	Pathology	To compare histopathologically the tissue of animals on treated and untreated diets (IAG/USDA/NCTR #940-943)

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The contents of this table reflect information available as of August 1984.

TOXICOLOGY METHODS DEVELOPMENT

FOOD AND DRUG ADMINISTRATION (Continued)

Methods	Area	Abbreviated Summary (Performing Organization and Project No.)
National Center for Toxicological Research	(Continued)	
Acute/Chronic Toxicity	(Continued)	
Effect of phenotypic differences in inbred mice on susceptibility to spontaneous neoplasms and to neoplasms induced by dietary administration of lindane	Carcinogenesis	To study the effect of phenotypic differences in inbred mice on susceptibility to spontaneous and induced neoplasms (NCTR #228)
Neurologic/Behavioral Toxicity		
Collaborative study in behavioral teratology	Teratogenesis/ Neurologic/Behavioral Toxicity	To test the interlaboratory reliability and sensitivity of a standardized behavioral teratology protocol to two known positive agents (NCTR #255, 285)
Analysis of d-amphetamine sulfate and methylmercury chloride	Chemistry/Neurologic/ Behavioral Toxicology	Using methods previously developed, purity assays, concentration certifications of dosage forms and stabilities of the test compound in the dosage form for both d-amphetamine sulfate and methylmercury chloride are performed periodically (NCTR #286)
Investigate neurotoxic effects of drug exposure during development	Teratogenesis/ Reproductive/ Developmental Toxicology	Investigate whether the pathogenesis of fetal alcohol syndrome is a consequence of the effects of ethanol on receptor systems and zinc-dependent processes (NCTR #6115)

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*Project under the National Toxicology Program
The contents of this table reflect information available as of August 1984.

100<

TOXICOLOGY METHODS DEVELOPMENT

FOOD AND DRUG ADMINISTRATION (Continued)

Methods	Area	Abbreviated Summary (Performing Organization and Project No.)
National Center for Toxicological Research	(Continued)	
System/Organ Toxicity		
Investigations into dog bladder and rat skin DNA binding	System/Organ Toxicity	To investigate the potential of chemicals to bind to dog bladder and rat skin DNA (NCTR #211, 387)
Correlation of Zn content in human hair and plasma among children diagnosed as "failing to thrive"	Chemistry/System/Organ Toxicity	In a clinical study, with 100 controls and 100 cases of failure to thrive (FTT), hair and plasma will be assayed by ICAP spectrometry for Zn and ancillary elements to determine if there is a relationship between elemental concentrations and FTT (NCTR #6031)

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*Project under the National Toxicology Program
The contents of this table reflect information available as of August 1984.

FOOD AND DRUG ADMINISTRATION (Continued)

Methods	Area	Abbreviated Summary (Performing Organization and Project No.)
Center for Devices and Radiological Health		
In Vivo		
Foreign body carcinogenesis in vivo	Carcinogenesis	An in vivo test system is being developed to test the ability of known carcinogenic monomers to produce sister chromatid exchange and aberrations when administered as monomers (individually) or as homo (mono) di and tripolymers in vivo to mice - (IAG with Genetic Toxicology Division of the Health Effects Research Laboratory of USEPA (IAG# 224-83-5002)
In Vitro		
Foreign body carcinogenesis in vitro	Genetic Toxicology	The ability of known carcinogenic monomers and their polymeric derivatives to cause single strand breaks, unscheduled DNA synthesis, mutation (6-thio guanine resistance), sister chromatid exchange and cell killing is being tested with and without eukaryotic metabolic cell mediated activation (Collaborative study with Division of Mutagenesis Research, NCTR)
In vitro transformation	Genetic Toxicology/ Carcinogenesis	The ability of known carcinogenic monomers and their polymeric derivatives to transform early passage rat epithelial cells (submaxillary gland) and to induce sister chromatid exchange in these same cells (In-house)
Develop mammalian cell viral systems to detect potentially photosensitizing compounds	Short Term In Vitro Target Organ Toxicity	The purpose of this research is to develop and test a rapid method for screening potentially photosensitizing chemicals. The test involves exposing human skin fibroblasts to test compounds and varying light spectra and evaluating the subsequent ability of the treated cells to support virus growth (OST)

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TOXICOLOGY METHODS DEVELOPMENT

FOOD AND DRUG ADMINISTRATION (Continued)

Methods	Area	Abbreviated Summary (Performing Organization and Project No.)
Center for Devices and Radiological Health		
In Vitro	(Continued)	
Influence of ultrasound on embryonic heart	Developmental Toxicity	Develop a time course protocol for the cinephotographic effects of cardiac function on the embryonic chick
Mutagenic effects of physical and chemical agents	Mutagenesis/ Genetic Toxicity	Development of new strains of L5178Y cells for testing of mutagenic activity of physical and chemical agents
Effects of electomagnetic radiation on cellular membrane and membrane-induced bioeffects	Biochemical, Cellular, and Tissue Effects	Cell culture systems will be utilized to monitor and compare the chronological actions of purified growth factors and hormones on electromagnetic radiation-sensitive events in the biologic cascade induced by these hormones

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The contents of this table reflect information available as of August 1984.

FOOD AND DRUG ADMINISTRATION (Continued)

Methods	Area	Abbreviated Summary (Performing Organization and Project No.)
Center for Drugs and Biologics		
Short-Term		
Electrocardiographic system for the detection of cardiac damage in lab animals used in toxicology experiments	Cardiovascular Toxicity	Develop best electrocardiogram model to detect chemically induced cardiac damage.
Develop and evaluate methods for detecting direct or indirect cardiac toxicity of drugs in animals	Cardiovascular Toxicity	Evaluate utility of isolated blood-perfused dog heart for acute and chronic toxicity testing.
Drug induced autoimmunity in mice of defined genetic background. Induction of antinuclear antibodies by mercuric chloride in mice	Immunologic Toxicity	Develop animal models for predicting drug-induced immunodeficiencies.
The effects of chemicals and drugs on intracranial pressure, cerebrospinal fluid dynamics, brain edema and the blood-brain barrier	Neurologic/Behavioral Toxicity	Develop experimental model for detection of drug effects on intracranial pressure.

The contents of this table reflect information available as of August 1984.

TOXICOLOGY METHODS DEVELOPMENT

FOOD AND DRUG ADMINISTRATION (Continued)

Methods	Area	Abbreviated Summary (Performing Organization and Project No.)
Center for Food Safety and Applied Nutrition		
In Vitro		
Development of screening methods for the detection of skin sensitizing antigens	Immunologic Toxicity	Involves the characterization of protein or other macromolecules that combine with weak skin sensitizers (Division of Toxicology, Project No. to be assigned)
Studies of human skin permeation, animal models for percutaneous absorption, and theoretical modeling of skin penetration	Dermal Toxicology	Involves use of in vitro models to predict blood and tissue levels in man as a result of the application of substances to the skin (Division of Toxicology, 10162)
An exploration of the basis for "false negative" results in the standard "Ames Test"	Mutagenesis/ Genetic Toxicity	The basis of these anomalous results will be sought through variations in test protocols, use of alternative bacterial mutants and/or assay of the enzymes responsible for activation (Division of Toxicology, 08402)
To explore the potential of *Saccharomyces cerevisiae* strains and procedures to monitor genetic effects	Mutagenesis/ Genetic Toxicity	Involves development of radiation sensitive strains; and improvement of metabolic activation procedures including those of intestinal flora (Division of Toxicology, 08402)
An organ maintenance approach for the selection of species for metabolism studies	Biochemical/Cellular/ Tissue Effects	Involves measurements of biochemical changes e.g., respiration, selected enzymes, uptake of ions, in kidney and liver cells of various species (Division of Toxicology, 09596)
To provide a rapid screen to detect DNA repair in primary cultures in rat hepatocytes	Mutagenesis/Genetic Toxicity	Involves adapting methodology for potential use in routine evaluation (Division of Toxicology, 08402)

The contents of this table reflect information available as of August 1984.

TOXICOLOGY METHODS DEVELOPMENT

FOOD AND DRUG ADMINISTRATION (Continued)

Methods	Area	Abbreviated Summary (Performing Organization and Project No.)
Center for Food Safety and Applied Nutrition (Continued)		
In Vitro (Continued)		
Assessment of immunotoxicity in the reproductive, neonatal and growth cycles	Immunotoxicity	Develop methods for assessment of immunotoxic effects on rodent fetal and neonatal lymphoid target organs following in utero exposure (Division of Toxicology, 11198)
To develop techniques for predicting toxicological problems arising from the exposure to various agents administered to a newborn	Reproductive/ Developmental Toxicity	Involves establishment of baseline values for assessment of the toxic sequel following administration of potential toxicants to sow-reared piglets and piglets fed artificial formula (Division of Toxicology, 09450)
Development of an in vitro model for studying teratogenesis	Reproductive/ Developmental Toxicity	Involves the use of whole rat fetus or fetal limb bud cultures exposed to known or suspected teratogens to determine possible biochemical mechanisms of teratogenesis and to assess the possibility of the use of this approach in toxicological evaluation (Project Number, 09596)
Development of method to determine effects of chemicals on T-cell subsets	Immunologic	This test will permit an assessment of the toxic action of chemicals on the Lyt 1 or Lyt 2 subset of T cells and develop information on the underlying mechanism of toxicity (DM, 11778)
To provide the capability to evaluate chemicals for their ability to transform cells in culture	Mutagenesis/Genetic Toxicology	Involves studies with the BALB/3T3 transformation assay and further evaluation of its potential to detect chemical carcinogens (Division of Toxicology, 08402)

The contents of this table reflect information available as of August 1984.

FOOD AND DRUG ADMINISTRATION (Continued)

Methods	Area	Abbreviated Summary (Performing Organization and Project No.)
Center for Food Safety and Applied Nutrition (Continued)		
In Vitro - Toxicology Testing		
Mishell-Dutton system	Immunologic	This assay is complete and in-place for use on request by the NTP Immunologic Toxicity program. Simultaneous determinations of the effects of chemicals on thymus-dependent and the two subclasses of thymus-independent antigens can be made (DM, 11778)
Alpha/beta, and gamma interferon assay	Immunologic	This assay system is complete and in-place for use on request by the NTP Immunologic Toxicity program. The effect of chemicals on alpha/beta or gamma interferon production can be determined. The interferon can be typed with specific antisera and the assay standardized with International units of interferon activity (DM, 11778)
In Vitro - In Vivo		
In vivo and *in vitro* analyses of lymphocyte function	Immunochemistry/ Immunotoxicity	Evaluation of *in vitro* tests of lymphocyte function as potential screens for immunotoxic effects. Project uses known immunomodulator drugs to cause effects, and compares *in vitro* and *in vivo* responses to validate findings (Division of Toxicology, 11198)
In Vivo		
Use of specular microscope to quantify corneal damage	Ocular Toxicity	Involves counting cells in corneal endothelium to assess irreversible damage to hydrating layer of cornea (Division of Toxicology, 11290)
Strategies for neurobehavioral toxicity testing	Neurologic/ Behavioral Toxicity	Involves the assessment of chemically-induced changes in nervous system function in the immature and adult organism (Division of Toxicology, 08855)

The contents of this table reflect information available as of August 1984.

FOOD AND DRUG ADMINISTRATION (Continued)

Methods	Area	Abbreviated Summary (Performing Organization and Project No.)
Center for Food Safety and Applied Nutrition (Continued)		
In Vivo (Continued)		
Use of HPLC to detect toxic drugs in the aqueous humor and the lens	Ocular Toxicity	Involves exposure of the eye to UV light to determine accumulation and possible phototoxic effects (Division of Toxicology, 11290)
Development of an in vivo model for phototoxicity	Ocular Toxicity	To develop a reliable animal model for screening compounds with potential cutaneous toxicity and phototoxicity (Division of Toxicology, 08980)
Study of metabolism of topically applied chemicals	Pharmacokinetics/ Metabolism	Chemicals of interest are applied topically to the experimental animal and the metabolites are studied in expired air, different organs, blood and urine. Comparison to the oral route can be performed (Division of Toxicology, 08980)
Study of skin sensitization, skin penetration and skin irritation in man	Dermal Sensitivity	Involves obtaining experimental data on man which is used to evaluate consumer complaints (University of California, San Francisco, Contract 223-78-2014)
Development and validation of a preservative efficacy testing method for cosmetic products	Dermal Sensitivity	An investigation of frequency, symptoms and cause of cosmetic-related adverse reactions in man (University of California, San Francisco, Contract 223-78-2015)
Biochemical parameters: macromolecular biosynthesis	Biochemical/Cellular/ Tissue Effects	Designed to develop sensitive methodologies to study the subtle effects of chemical contaminants on macromolecular metabolism in animal cells, e.g., RNA, DNA (Division of Toxicology, 09596)
Biochemical parameters of toxicology: polyamine biochemistry, polyamine and ornithine decarboxylase analysis	Biochemical/Cellular/ Tissue Effects	To detect biochemical changes in cells and tissues related to cell growth and proliferation (Division of Toxicology, 09450)

The contents of this table reflect information available as of August 1984.

FOOD AND DRUG ADMINISTRATION (Continued)

Methods	Area	Abbreviated Summary (Performing Organization and Project No.)
Center for Food Safety and Applied Nutrition (Continued)		
In Vivo (Continued)		
To further develop a model for the screening of chemicals for their potential cardiotoxicity employing in vivo and in vitro procedures	Cardiovascular Toxicity	Involves the assessment of pathophysiological damage to tissue in dogs and/or minipigs, as well as determination of the utility of an isolated heart preparation for screening of in vivo administered agents for potential cardiotoxicity (Division of Toxicology, 09450)
Human health effects of exposure to a variety of pesticides and industrial chemicals	Epidemiology and Clinical Toxicology	Studies to determine the risk of exposure to chemicals and the risk of adverse human health effects from such exposure (Epidemiology and Clinical Toxicology)
Primary liver cancer mortality compared to incidence	Epidemiology and Clinical Toxicology	An assessment of the incidence of primary liver cancer incidence in SMSA's compared to mortality from state death records (Epidemiology Unit)
Comparative study of disposition of orally ingested PCA in four species of animals	Pharmacokinetics/ Metabolism	Determination of the metabolic fate of PCA in rats, rabbits, dogs and minipigs will provide a wider phylogenetic base for extrapolation to the potential human hazard (Division of Toxicology, 11165)
Comparative tissue distribution of orally administered psoralens in two species	Pharmacokinetics/ Metabolism	Tissue distribution studies of orally administered isotopically labeled 8-methoxypsoralen in both carnivores (dog) and omnivores (pig) would extend the comparative data base on psoralens and provide useful information in assessing their potential risk (Division of Toxicology, Project No. to be assigned)

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TOXICOLOGY METHODS DEVELOPMENT

FOOD AND DRUG ADMINISTRATION (Continued)

Methods	Area	Abbreviated Summary (Performing Organization and Project No.)
Center for Food Safety and Applied Nutrition (Continued)		
In Vivo (Continued)		
Tissue distribution of ^{14}C-cinnamic aldehyde after oral administration to rats	Pharmacokinetics/ Metabolism	It has been suggested that cinnamic aldehyde might react as an alkylating agent with macromolecules. A tissue distribution study would elucidate possible target organs or storage depots. (Division of Toxicology, Project No. to be assigned)
Baseline biochemical parameters for various species and strains	Biochemical/Cellular/ Tissue Effects	Clinical chemistry profiles are determined to construct a bank of baseline normal values at different stages of growth and development for various animals. (Division of Toxicology, 09450)
Endocrine indices of teratogenesis or reproductive toxicity	Toxicology	Blood levels of select hormone(s) are determined in normal and toxin-exposed animals to assess the utility of this measure as an index of teratogenesis or reproductive toxicity (Division of Toxicology, 09450)
Neurobehavioral parameters sensitive to changes in membrance permeability	Neurologic/Behavioral Toxicity	Behavioral profiles are obtained to determine whether certain behavioral processes are differentially sensitive to certain defined changes in membrance ion permeability (Division of Toxicology, 08855)
Development of the most sensitive clinical chemistry parameters associated with target organ damage	Toxicology	Standard clinical chemistries and new test chemistries are correlated with histopathological findings to identify the most sensitive indices associated with tissue damage (Division of Toxicology, 09450)
Evaluate the safety of food additives or natural contaminants in infant formulas	Biochemical/Cellular/ Tissue Effect	Involves experiments to determine target organs, biochemical parameters, appropriate dose levels, and duration of treatment for selected compounds (Division of Toxicology, 12373)

The contents of this table reflect information available as of August 1984.

FOOD AND DRUG ADMINISTRATION (Continued)

Methods	Area	Abbreviated Summary (Performing Organization and Project No.)
Center for Food Safety and Applied Nutrition	(Continued)	
In Vivo	(Continued)	
Toxicological studies of trypsin inhibitors	Toxicology/Nutrition	Effect of trypsin inhibitors on the exocrine pancreas of minipigs and rats will be evaluated (Division of Toxicology, 12373; Division of Nutrition, 12464)
Acute toxicity test of butylated hydroxy anisole (BHA) in beagle dogs	Toxicology	Study involves feeding beagle dogs diets containing BHA at two dose levels for 6 months. The high dose will be determined by a palatability study now underway. Pathological/histological examination of stomach will be done at conclusion of 6 month feeding (Division of Toxicology)
Cardiovascular toxicity of cadmium	Cardiovascular Toxicology	Study involves monitoring of blood pressure, heart rate and EKG in beagle dogs for up to 120 days while receiving daily doses of low levels of cadmium orally. It is also anticipated that the effect of low levels of cadmium on coronary perfusion pressure, EKG, force of contraction and heart rate of isolated heart preparations will be investigated (Division of Toxicology, 11165)
Fetal distribution of xenobiotics	Pharmacokinetics/ Metabolism	To develop a model system for measuring the uptake of radiolabeled xenobiotics by dog and minipig fetuses and calculation of the placental barrier (Division of Toxicology, 09450)
A comparison of cardiovascular parameters in two strains of minipigs	Cardiovascular Toxicology	To assess the credibility of Hormel - Hanford vs. Yucatan minipigs as the best model system for investigation of cardiovascular responses in unanesthetized, restrained, animals, (Division of Toxicology, 09450)

The contents of this table reflect information available as of August 1984.

FOOD AND DRUG ADMINISTRATION (Continued)

Methods	Area	Abbreviated Summary (Performing Organization and Project No.)
Center for Food Safety and Applied Nutrition (Continued)		
In Vivo (Continued)		
Method for measurement of coronary blood flow	Cardiovascular Toxicology	To develop a reliable method for measurement and recording of coronary blood flow in beagle dogs and miniature swine (Division of Toxicology, 09450)
Metabolism of vitamin A in rats with various levels of endogenous vitamin A	Metabolism and Nutrition	Rats with various (deficient, normal, high) vitamin A burdens will be administered radioactive isotopes of vitamin A. The metabolism of the labelled compound will be studied (Division of Nutrition, 09847)
Plaque acidity method for evaluation of cariogenic potential of foods	Nutrition, Metabolism and Nutrient Toxicity	A method is being tested under contract (223-80-2370) to permit evaluation of the cariogenic potential of different foods and forms of foods. The method involves the use of dental devices containing microelectrodes for measuring local pH changes (Division of Nutrition, 12077)
Dietary models development	Nutrition and Toxicology	Standard rat diets providing marginally adequate and appropriate levels of nutrients are being developed for use in studies of nutrient excess and deficit and in standard toxicological studies (Division of Nutrition, 00384)
Diet and brain function	Nutrition, Food Additives, and Behavior	This contract effort (223-85-2095) will examine what role, if any, changes in dietary carbohydrate and protein (amino acids) play in altering levels of brain neurotransmitter precursors (Division of Nutrition, 11585)
Effects of soy products	Nutrition, Toxicology and Metabolism	Studies of the adverse effects of various soy protein products on trace mineral nutriture (Division of Nutrition, 00384)

111<

The contents of this table reflect information available as of August 1984.

TOXICOLOGY METHODS DEVELOPMENT

FOOD AND DRUG ADMINISTRATION (Continued)

Methods	Area	Abbreviated Summary (Performing Organization and Project No.)
Center for Food Safety and Applied Nutrition	(Continued)	
In Vivo	(Continued)	
Nutrition impact on brain function	Nutrition Toxicology Neurologic/Behavioral Toxicity	Development of approaches and selection of tests to investigate neurofunctional consequences of specific nutrient imbalances controlled through use of isocaloric, isoprotein diets containing varying levels of carbohydrates (Division of Toxicology, 08855, in collaboration with Division of Nutrition)
Effects of perinatal factors on physical and behavioral development	Neurologic/Behavioral Toxicity	Evaluation of techniques to compare differences in physical and neurobehavioral development, from birth to weaning, among rat offspring derived by caesarean and normal birth (Division of Toxicology, 08855)
Cognitive development in preweaning rats	Neurologic/Behavioral Toxicity	Validation of homing/discrimination and active avoidance tests using pharmacologic compounds that are known to be neuroactive. Development and validation of additional tests of cognitive development as time and resources permit (Division of Toxicology, 08855)
Enzyme immunoassays (EIAs) for rat serum gamma globulins and antibodies to vaccines	Immunochemistry/ Immunotoxicity	Development of EIA's for evaluation of the rat's immune responses to select test vaccines including simulated, licensed human vaccines, and evaluation of a multi-component test vaccine (Division of Toxicology, 11198)
Miniature swine model for immune response evaluation	Immunotoxicity	Determination of basal immunologic parameters, evaluation of the swine's immune responses to a battery of test antigens, evaluation of delayed hypersensitivity as a measure of immune function, and development of a positive immunosuppression control (Division of Toxicology, 11198)

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TOXICOLOGY METHODS DEVELOPMENT

FOOD AND DRUG ADMINISTRATION (Continued)

Methods	Area	Abbreviated Summary (Performing Organization and Project No.)
Center for Food Safety and Applied Nutrition	(Continued)	
In Vivo	(Continued)	
Biotechnology-derived protein and enzyme food additives	Immunochemistry/ Immunotoxicity	Involves defining characterization techniques that can be utilized to establish the identity of protein products produced by biotechnology processes and addresses test methods for detection of potential adverse effects (Division of Toxicology, 11198)
Initiation and promotion of skin tumor formation by Vomitoxin	Tumorigenesis/ Dermal Toxicology	A skin painting study using the carcinogen sensitive SENCAR mouse strain to test the tumorigenic and tumor promotional capability of Vomitoxin, a mycotoxin.
Effects of aging on mixed function oxidase (M.F.O.) systems and their relationship to the toxicity of xenobiotics	Biochemical/ Cellular/Tissue Effects	To study the effects of aging on the hepatic biotransformation of xenobiotics in minipigs as a model for assessing the induction mechanisms in humans (Division of Toxicology, 09450)
Epidemiologic and Clinical Methods		
Human and animal health effects from exposure to trichothecenes	Epidemiology and Clinical Toxicology	Assessment of the human epidemiology data and animal toxicology data to determine risk and levels of cancer for the trichothecenes (Epidemiology and Clinical Toxicology Unit)
Effects of chemical substances on increased risk of pancreatic, liver and bladder cancer	Epidemiology and Clinical Toxicology	Assessment of increased risk of pancreatic, liver or bladder cancer from consumption of caffeine, soy products and artificial sweeteners (Epidemiology and Clinical Toxicology)

The contents of this table reflect information available as of August 1984.

TOXICOLOGY METHODS DEVELOPMENT

FOOD AND DRUG ADMINISTRATION (Continued)

Methods	Area	Abbreviated Summary (Performing Organization and Project No.)
Center for Food Safety and Applied Nutrition (Continued)		
Epidemiologic and Clinical Methods		
Human and animal health effects from exposure to dioxins	Epidemiology and Clinical Toxicology	Continuation of epidemiologic and toxicology studies of exposure to the dioxins and outcome (Epidemiology and Clinical Toxicology Unit)
Epidemiology studies of natural toxicants and liver cancer	Epidemiology and Clinical Toxicology	Assessment of increased risk of liver cancer from exposure to natural toxicants (aflatoxins and other) (Epidemiology and Clinical Toxicology)
Association between dietary factors and cancer	Epidemiology	Assessment of NHANES and other epidemiological data to determine the possible association of dietary factors (fat, Vitamin A, etc.) with an increased or decreased risk of cancer and whether or not there appears to be an increase in U.S. cancer incidence (Division of Nutrition, 10219)
Analytical Chemistry Methods		
Extend method for 2,3,7,8-TCDD to higher chlorinated dioxins and chlorinated dibenzofurans	Analytical Chemistry	Methodology for TCDD is in place; extension of this and other methodology to furans and other dioxins is needed for fish and and other foods/matrices.
Develop analytical capability for organotin compounds	Analytical Chemistry	The chemical form of tin residues in foods will be investigated via evaluations of liquid and gas chromatographic techniques.
Method for pentachlorophenol in foods	Analytical Chemistry	Collaborate in procedure for fish, eggs, gelatin and milk.

The contents of this table reflect information available as of August 1984.

FOOD AND DRUG ADMINISTRATION (Continued)

Methods	Area	Abbreviated Summary (Performing Organization and Project No.)
Center for Food Safety and Applied Nutrition (Continued)		
Analytical Chemistry Methods		
Development of analytical procedures for analysis of dimethyl terephthalate (DMT)	Analytical Chemistry	Methods will be developed for detection and quantitation of dimethylterephthalate in PET beverage bottles.
Study of decomposition products of BHT and Irganox 1010	Analytical Chemistry	Methods will be applied to the separation and identification of major antioxidant decomposition products in food packaging materials.
Volatiles survey in food packaging	Analytical Chemistry	Survey of selected packaging products to be conducted to obtain incidence/level data upon which to base an assessment of risk.
Study enzymatic techniques for determination of direct food additives (DFA)	Analytical Chemistry	To investigate enzymes as a means of facilitating determination of DFA through quantitation of analyte and digestion/hydrolysis of matrice to ease recovery of DFA.
Determine decomposition products of antioxidants	Analytical Chemistry	To isolate and identify the major decomposition products of BHT, BHA, and TBHQ by chromatographic techniques and in vitro bioassay studies. Where necessary, selected compounds will be synthesized.
Develop rapid sample extraction and clean-up techniques for the determination of DFA, their decomposition and/or reaction products.	Analytical Chemistry	To investigate the loop-column as a means of rapid sample extraction and clean-up for online HPLC analysis of DFA, their decomposition and/or reaction products.

The contents of this table reflect information available as of August 1984.

TOXICOLOGY METHODS DEVELOPMENT

FOOD AND DRUG ADMINISTRATION (Continued)

Methods	Area	Abbreviated Summary (Performing Organization and Project No.)
Center for Food Safety and Applied Nutrition	(Continued)	
Analytical Chemistry Methods	(Continued)	
Analytical methodology for vomitoxin	Analytical Chemistry	Methods (TLC, HPLC, GC) developed in FY 1984 will be further studied, and GC/MS and HPLC/MS confirmatory techniques improved.
Vomitoxin surveys in foods and feeds	Analytical Chemistry	Surveys of selected commodities will be conducted to obtain incidence/level data upon which to base an assessment of risk.
Analytical methodology for cyclopiazonic acid	Analytical Chemistry	Cyclopiazonic acid will be isolated and purified and analytical methodology will be revised/developed.
Analytical methodology for Alternaria toxins	Analytical Chemistry	Methods will be developed or revised for detection and quantitation of the Alternaria toxins in tomato products and grains. Methods will be applied to tomato products to determine relationship of toxins to mold counts.
Analytical methodology for pyrrolizidine alkaloids	Analytical Chemistry	Isolate pyrrolizidine alkaloids from comfrey root for reference standards.
Study of herbal teas	Analytical Chemistry Toxicology	Herbal tea extracts will be examined for potentially toxic components.
Analytical methodology for PSP	Analytical Chemistry	Methods (TLC, HPLC) will be developed for detection and quantitation of the PSP toxins. Standards of the individual toxins will be purified and criteria of purity established.
Analytical methodology - seafood toxins	Analytical Chemistry	Analytical techniques for detection and confirmation of identity of the seafood toxins, ciguatoxin and tetrodotoxin, will be developed.

The contents of this table reflect information available as of August 1984.

TOXICOLOGY METHODS DEVELOPMENT

FOOD AND DRUG ADMINISTRATION (Continued)

Methods	Area	Abbreviated Summary (Performing Organization and Project No.)
Center for Food Safety and Applied Nutrition (Continued)		
Analytical Chemistry Methods (Continued)		
Toxicological support	Analytical Chemistry	Chemistry support will be provided for toxicological studies on natural toxicants. Such support will include preparation and purification of the study materials, analyses of feed and tissue samples.
Immunoassay methods for natural toxins	Analytical Chemistry	Immunoassays will be developed and tested for selected natural toxins (aflatoxins, PSP).
Analytical methodology for transformed food constituents	Analytical Chemistry	Continuation of methods development for trans-fatty acid and cholesterol oxide analyses (Division of Nutrition, 07772)
Develop multifumigant analytical method	Analytical Chemistry	Approaches will be developed to establish capability for a broad range of fumigant residues in foods.
Develop methods to identify and quantify the components in color additives	Analytical Chemistry	This is a continuing project to update existing methods and to develop new methods for certification purposes and for use in obtaining data to be used in regulatory decision making or for use in research studies (CFSAN/FDA #01014)
Develop methods to identify and quantify color additives in foods, drugs, and cosmetics	Analytical Chemistry	This is a project to provide FDA with accurate and efficient methods for the regulation of color additive use. We are now introducing high performance liquid chromatography in the analytical scheme (CFSAN/FDA #01014)
Other		
Mechanism of placental heavy metal transfer and subcellular distribution	Toxicology	To study the mechanism of placental transfer of lead and cadmium (Institute of Occupational Medicine, Sonsnoweic, Poland, US/Polish Joint Agreement, Division of Toxicology)

The contents of this table reflect information available as of August 1984.

TOXICOLOGY METHODS DEVELOPMENT

FOOD AND DRUG ADMINISTRATION (Continued)

Methods	Area	Abbreviated Summary (Performing Organization and Project No.)
Center for Veterinary Medicine		
In Vivo		
Interlaboratory testing of aquatic model ecosystem protocol	Multi-trophic level bioassay	The objectives of this project are: (1) to conduct an interlaboratory standardization trial of a microcosm method developed under FDA contracts 223-76-8348 and 223-80-2352, and (2) to increase the power of the method to predict specific ecosystem-level effects (contractor to be selected, CVM-7-83)
Development of analytical method for chloramphenicol and its metabolites	Analytical Chemistry	Involves the development of a GLC method for chloramphenicol and its metabolites in tissues and body fluids (DVMR, 233)
Development of HPLC method for the separation of streptomycin and dihydrostreptomycin from other aminoglycoside drugs	Analytical Chemistry	Initially, attempts will be made to separate streptomycin, dihydrostreptomycin and neomycin. Chemical derivation to product fluorescent compounds with fluorescamine, o-phthaldehyde or dansylchloride will be applied to achieve enhanced sensitivity (DVMR, 254)
Develop an HPLC method for tylosin and erythromycin in tissues, blood and urine	Analytical Chemistry	The suitablility of the present HPLC method development in EDRO-Boston wil be determined for erythromycin in milk. The procedure will then be applied to the same drugs extracted from tissues, blood and urine from both spiked and dosed tissues.
In Vitro		
Xenobiotic metabolism in isolated bovine hepatocyte	Metabolism	Determine (1) whether an in vitro model based on isolated bovine hepatocytes is biologically acceptable approach for studying xenobiotic metabolism in bovine species; (2) whether the bovine hepatocyte is valid for predicting the generation of metabolites in the whole animal; and (3) the metabolic fate of selected chemical substances in vivo in cattle and in vitro (isolated hepatocytes) (CVM-5-82)

The contents of this table reflect information available as of August 1984.

TOXICOLOGY METHODS DEVELOPMENT

CENTERS FOR DISEASE CONTROL/NATIONAL INSTITUTE FOR OCCUPATIONAL SAFETY AND HEALTH

Methods	Area	Abbreviated Summary (Performing Organization and Project No.)
Short Term		
*Development of teratogenesis screening methods	Teratogenesis	Involves the evaluation of a postnatal mouse screening test for rapid screening of teratogens. Another aspect of this project is to develop methods appropriate for determining teratogenicity of compounds absorbed through the skin (Division of Biomedical and Behavioral Science - Project VOO Ahy 340)
*Percutaneous absorption	Cutaneous	Methods will be developed for quantitative determination of percutaneous absorption of liquids and vapors (Division of Biomedical and Behavioral Science - Project VOO Jhy 335)
*Methodologies for worksite neurotoxicity evaluations	Neurotoxicity	The project will lead to prescribed tests for evaluating workspace exposure to neurotoxicants. (Division of Biomedical and Behavioral Science - Project VOB Cyy 248)
In Vitro		
*Identifying workplace co-carcinogens by in vitro tests	Carcinogenesis	Project will evaluate existing in vitro systems used for identifying cocarcinogens. Ultimate goal is to develop a tiered, rapid screen for workplace cocarcinogens (Division of Biomedical and Behavioral Science - Project VOO Myy 343)
*In vitro mutagenesis studies	Mutagenesis	This project addresses: 1) improvements in the existing assay systems, 2) development of test systems which can be used for worksite studies, and 3) assessment of the body fluid mutagenic analysis and sister chromatid exchange assay systems for possible use in NIOSH Health Hazard Evaluations (Division of Respiratory Disease Studies - Project VKC Ady 109)

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*Project under the National Toxicology Program
The contents of this table reflect information available as of August 1984.

TOXICOLOGY METHODS DEVELOPMENT

CENTERS FOR DISEASE CONTROL/NATIONAL INSTITUTE FOR OCCUPATIONAL SAFETY AND HEALTH (Continued)

Methods In Vivo	Area	Abbreviated Summary (Performing Organization and Project No.)
*Investigation of *Drosophila* for teratogenesis screening	Teratogenesis	The potential use of *Drosophila melanogaster* for prediction of teratogenesis will be evaluated (Division of Biomedical and Behavioral Science - Project VOO Ahy 344)
*Assessing utility of biochemical indices of male reproductive impairment	Reproductive	Project will determine the suitability of measuring serum levels of LDH-X, an isozyme of lactic dehydrogenase, as an early indicator of testicular damage in exposed humans (Division of Biomedical and Behavioral Science - Project VOO Ahy 317)
*Biomonitoring of exposure to asphalt and coal tar	Carcinogenesis	The project will develop biological monitoring methods for assessment of workers exposure to coal tar pitch and asphalt (Division of Biomedical and Behavioral Science - Project VOT Uyy 392)
*Biomonitoring of populations exposed to aromatic amines	Carcinogenesis	The project will develop a biomonitoring method for measuring chemical - DNA adducts in workers exposed to aromatic amines and aromatic nitro compounds (Division of Biomedical and Behavioral Science - Project VOO Mdy)

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*Project under the National Toxicology Program
The contents of this table reflect information available as of August 1984.

NATIONAL INSTITUTE OF MENTAL HEALTH

Methods	Area	Abbreviated Summary (Performing Organization and Project No.)
Renal function studies	Lithium-induced Renal Toxicity	To determine whether the use of lithium maintenance therapy in the treatment of affective disorder is associated with the development of renal insufficiency and to define potential prognostic factors (e.g., serum lithium levels, duration of treatment, associated defects in renal concentrating ability) that may influence the incidence, time course of development, severity, and reversibility of the disorder (University of Pennsylvania School of Medicine, 5R01-MH/AM33242-05A1)
Behavioral assessment of motor abnormalities	Tardive Dyskinesia	To develop and use sensitive techniques for study of abnormal movements induced in monkeys by the neuroleptic haloperidol (University of Rochester, 5R01-MH11752-19)
Epidemiologic study of incidence and risk factors	Tardive Dyskinesia	To study prospectively the development of tardive dyskinesia in a large sample of psychiatric patients receiving neuroleptic medication (L.I. Jewish-Hillside Medical Center, 2R01-MH32369-06)
Psychometric study of rating scales for assessing side effects in clinical trials	Assessment Methodology	To provide a psychometric analysis of a new side effects (adverse reactions) rating scale in terms of its reliability (both test-retest and interrater) and its validity (both in relation to standard scales and the new scale's capacity to differentiate among treatments and drug dosages) (Tennessee Neuropsychiatric Institute, 5R01-MH38768-08)
Psychometric study of rating scales for assessing side effects in clinical trials	Assessment Methodology	To assess psychiatric patients with varying demographic and diagnostic criteria receiving varying psychopharmacologic medication on the two different forms of a new side effects rating scale in order to determine the scale's reliability, validity and other psychometric properties (Research Foundation for Mental Hygiene, 5R01-MH38753-02)

121<

The contents of this table reflect information available as of August 1984.

TOXICOLOGY METHODS DEVELOPMENT

NATIONAL INSTITUTE OF MENTAL HEALTH (Continued)

Methods	Area	Abbreviated Summary (Performing Organization and Project No.)
Epidemiologic study of course and risk factors	Tardive Dyskinesia	To conduct a study on the incidence and course of drug-related abnormal movements characterized as dyskinesia in the institutionalized mentally retarded, including mentally retarded children (University of Illinois, 2R01-MH32206-06)
Stimulant drug induced psychosis	Central Nervous System Toxicity	To measure the biochemical and behavioral effects of stimulant drugs to determine mechanisms of action (University of Pittsburgh ,5R01-MH24714-08)
Studies of neuroleptic induced tardive dyskinesia	Central Nervous System Toxicity	To develop a model for neuroleptic induced tardive dyskinesia and study underlying mechanisms (Chicago Medical School, R01-MH33991-03)
Studies of neuroleptic induced tardive dyskinesia	Central Nervous System Toxicity	To investigate the role of neuromelanin in the induction of dyskinesias (New York State Psychiatric Institute, R01-MH33946-02)
Studies of dyskinesias produced by antipsychotic drugs	Central Nervous System Toxicity	To examine age-related toxic effects of psychoactive drugs (Texas Research Institute of Mental Sciences, 5R01-MH34692-03)
Mechanism of tardive dyskinesia	Central Nervous System Toxicity	To develop methods of predicting susceptibility to drug induced dyskinesias (University of Michigan, 5R01-MH36044-03)
Long-term study of tardive dyskinesia	Central Nervous System Toxicity	To develop methods of predicting susceptibility to neuroleptics (Medical Science Foundation of Oregon, 5R01-MH36657-03)
Developmental toxicity	Behavioral Toxicity	To examine offspring exposed in utero to stress or diazepam - for behavioral or neurochemical deficits (University of Rochester, 5R01-MH31850-05)

The contents of this table reflect information available as of August 1984.

TOXICOLOGY METHODS DEVELOPMENT

NATIONAL INSTITUTE OF MENTAL HEALTH (Continued)

Methods	Area	Abbreviated Summary (Performing Organization and Project No.)
Psychometric study of rating scales for assessing side effects in clinical trials	Assessment Methodology	To provide a psychometric analysis of a new side effects (adverse reactions) rating scale in terms of its reliability (both test-retest and interrater) and its validity (both in relation to standard scales and the new scale's capacity to differentiate among treatments and drug dosages)(University of Miami, 1R01-MH38751-01)
Epidemiologic study of course and clinical trials	Tardive Dyskinesia	To study the course of newly developed tardive dyskinesia and to evaluate the efficacy of several putative treatments for it (Boston Mental Health Foundation, 2R01-MH32675-05)
Studies of neuroleptic drug effects	Central Nervous System Toxicity	To develop methods to detect antipsychotic drugs which do not produce extrapyramidal side effects (Yale University, 5R01-MH28849-08)
Drug interactions	Central Nervous System Toxicity	To examine the mechanism of cholinergic-induced lithium neurotoxicity (Washington University, 1R01-MH37967-01)

The contents of this table reflect information available as of August 1984.

TOXICOLOGY METHODS DEVELOPMENT

DEPARTMENT OF ENERGY

Methods	Area	Abbreviated Summary (Performing Organization and Project No.)
Detection of disease-related abnormal human proteins	Toxicology	This task concerns the Human Protein Index. The Human Protein Index will assist in the detection of new proteins and will assist in the discovery of disease- or injury-associated changes in cell or tissue protein production. Two-dimensional electrophoretic maps have been prepared of human peripheral blood lymphocytes, tissue-culture fibroblasts, muscle, red cell lysates, plasma, urinary proteins, and seminal plasma. Methods for identifying known proteins in the maps have been developed (RPIS 2454 - Argonne National Laboratory)
In Vitro		
Development of assay to detect and characterize teratogenicity	Teratology	In vitro system using measurements of cellular interaction with beads as a possible index of cell-to-cell interaction is being developed as an assay for potentially teratogenic substances. The system is also intended to provide basic information about potential mechanisms of terata development (RPIS 9153 - Massachusetts Institute of Technology)
In Vivo - In Vitro		
Determination of correlates of various toxicity tests for coal liquefaction fractions	Validation	The objective is to determine what, if any, correlations exist for new and innovative coal liquefaction processes and upgraded coal liquefaction materials among results from 4 bacterial tests, 2 mammalian cellular tests, a mouse skin painting initiation/promotion carcinogenesis test and a whole life time mouse skin painting carcinogenesis test. The cellular systems under test are: Ames S.TA98, 8-Ag., Fluctuation, Inductest, SHE and CHO (Oak Ridge National Laboratory and Pacific Northwest Laboratory - #25-30-10)

The contents of this table reflect information available as of August 1984.

TOXICOLOGY METHODS DEVELOPMENT

DEPARTMENT OF ENERGY (Continued)

Methods	Area	Abbreviated Summary (Performing Organization and Project No.)
In Vivo - In Vitro (Continued)		
Testing - genetics and mutations	Development and Validation	Are developing an in vivo mouse system to identify and measure new inversion mutations. Also are using the testes of male offspring as an indicator system to identify reverse mutations which could occur following mutation induction by administration of ethylnitrosourea to the sires of the offspring (Jackson Laboratory - RPIS 8948)

The contents of this table reflect information available as of August 1984.

TOXICOLOGY METHODS DEVELOPMENT

ENVIRONMENTAL PROTECTION AGENCY

Methods	Area	Abbreviated Summary (Performing Organization and Project No.)
Predictive mathematical modeling	Respiratory Toxicity	The objectives are to develop theoretical models of respiratory tract deposition of ozone and nitrogen dioxide, to experimentally validate a theoretical model for ozone uptake, and to determine species sensitivity to ozone at equivalent predicted concentrations (HERL/A104B0301)
In vitro, *in vivo* methods to identify toxic hazardous air pollutants	Genetic Toxicity/ Carcinogenesis/ Mutagenesis/ Teratogenesis	The objectives are to develop and validate methods to identify potentially toxic components in ambient air and source emissions and to quantify the contribution of specific genotoxicants to the mutagenicity of source emissions and ambient air. Procedure involves development and evaluation of air sampling methodologies, chemical and biological extraction methods, and *in vitro*/*in vivo* bioassay of hazardous air pollutants (HERL/A109C0801)
Integrated air-cancer methods	Mutagenesis/ Carcinogenesis	The objective is to develop the scientific methods and data bases for identifiying the major sources of carcinogenic chemicals emitted into the air and/or arising from atmospheric transformation. This research will also be designed to improve the methodology and data base for assessing human exposure and risk to airborne carcinogens. (HERL/A109C1201)
In vivo short-term response indicators development	Neurotoxicity	The objective is to determine the relationship of indicators of neurotoxicity to disease states and/or neurobehavioral dysfunction which will permit development of more sensitive predictive neurobehavioral assays of toxic chemicals (HERL/A109C 0501)

The contents of this table reflect information available as of August 1984.

ENVIRONMENTAL PROTECTION AGENCY (Continued)

Methods	Area	Abbreviated Summary (Performing Organization and Project No.)
Predictive models to assess dose-response effects of gases and particulates	Respiratory Tract and Pulmonary Toxicity	The objectives are to develop theoretical models of respiratory tract deposition of SO_2 and to improve regional deposition and physiochemical data for extrapolation of effective pollutant concentrations between animals and humans (HERL/A119B0101)
In vivo physiological monitoring methods	Cardiovascular Toxicity/ Pulmonary Toxicity	The objective is to develop instrumentation and methods to evaluate the physiological responses of humans to pollutants such as SO_2 and CO in order to assess human health risk. The Cardiac Exercise Stress Processor (CESP) is being validated and miniaturized for field use (HERL/A119B0201)
Short-term biomonitoring techniques for water quality	Chemical Toxicants	The objective is to provide field tested and validated biomonitoring techniques for health evaluation of waters impacted by complex chemical effluents (HERL/B107B0501)
In vivo bioassay for drinking water health hazards	Carcinogenesis/ Target Organ Toxicity	The objective is to develop, validate, and apply a methodology for assessing the overall health hazards presented by the bulk of organic material present in drinking water. Over 90% of this material is non-volatile and thus not identifiable by gas chromatography or mass spectroscopy. Qualitative indicators are used to identify biologically active chemicals. *In vivo* assays of mixtures and/or individual chemicals are used to quantify risks (HERL/C104A1001)
Use of experimental models to distinguish tumor initiating from tumor promoting chemicals	Carcinogenesis/ Target Organ Tumorigenesis	The objectives are to develop methods that establish whether a chemical produces cancer by tumor initiating (genotoxic) or tumor promoting (non-genotoxic) mechanisms and to determine the extent to which this differentiation should affect low-dose extrapolations of data. Use is being made of experimental models reported in the literature (HERL/C104A1101)

The contents of this table reflect information available as of August 1984.

TOXICOLOGY METHODS DEVELOPMENT

ENVIRONMENTAL PROTECTION AGENCY (Continued)

Methods	Area	Abbreviated Summary (Performing Organization and Project No.)
In vivo/*in vitro* extrapolation models	Genetic Toxicology/ Carcinogenesis	The objective is to provide a biological basis for the use of cross-species and low-dose extrapolation models. Use will be made of preneoplastic responses of tissues to chemical carcinogens of varying types (i.e. initiators, promoters, and cocarcinogens) to obtain low-dose response rates in small number of animals. A cross-species extrapolation will be validated through *in vitro* comparisons of target tissues from man vs. experimental animals (HERL/C104A1102)
In vivo and *in vitro* bioassays	Reproductive Toxicity/ Teratology	The objective is to develop bioassays for the detection of adverse alterations in developmental and reproductive processes in animals, with specific attention to alternative reproductive toxicity tests and bioassays to provide accurate evaluations of critical organ function in the neonate (HERL/E104B0901)
In vivo, *in vitro* testing methods	Teratogenesis/ Reproductive Toxicity	The objective is to develop and validate methods to identify potential teratogens and reproductive toxins in ambient air and source emissions. This includes: development of cost-effective screening procedures to identify toxins requiring further testing and eliminate those with no apparent toxicity; development of test procedures to evaluate critical subpopulations, such as the peri-pubertal and the aging animal; and development of *in vitro* procedures which will allow extrapolation of test data to other species including man. (HERL/A109C0802)
In vivo, *in vitro* mutagenicity test battery	Genetic Toxicity	The objective is the development, validation, and implementation of techniques for determining genetic effects of human exposure to chemical carcinogens and mutagens. Estimates of exposure and dosimetric studies of DNA adduct formation provide quantitative bases for the extrapolation of data from whole animal systems to humans (HERL/E104B0903)

The contents of this table reflect information available as of August 1984.

ENVIRONMENTAL PROTECTION AGENCY (Continued)

Methods	Area	Abbreviated Summary (Performing Organization and Project No.)
In vivo, in vitro biochemical and anatomical test systems	Neurotoxicity/ Behavioral Dysfunction	Biochemical and anatomical test systems are applied to identify the principal sites and processes of neurotoxic activity of organophosphate pesticides in order to determine the relationship of indicators of neurotoxicity to disease states and/ or behavioral dysfunction (HERL/E104B0904)
In vivo, in vitro pesticides risk models	Teratogenesis/ Reproductive Toxicity	The objective is to gain a better understanding of the biological significance of teratology/reproductive test data. Interspecies differences in the dermal penetration of pesticides, structure-activity relationships in teratogenesis, and potential interactions between alterations in maternal health status will be evaluated (HERL/E104A0301)
In vivo, in vitro detection methodology	Carcinogenesis	The objective is to develop rapid, sensitive and accurate methods to detect pulmonary carcinogens using rodent and human pulmonary target tissues in vivo and in vitro. In vitro methods include pulmonary tissue cultures from treated and untreated rodents and incorporation of human tissues and cells as activation and target components of carcinogenesis bioassays. In vivo methods include development of more sensitive animal strains to increase responsiveness of pulmonary tissue to carcinogen treatment (HERL/L104B0701)
In vitro oncogenic transformation bioassay	Carcinogenesis	The objective is to develop methods to improve the sensitivity of oncogenic cell transformation bioasssay systems towards all classes of carcinogens. Approaches include presensitization of cells with chemicals or hormones; addition of exogenous metabolic activation enzyme fractions; cell/cell co-cultivation systems; and cell-hybrids for improved metabolic activation. Additional studies determine the usefulness of these cells in evaluating multiple-chemical exposure effects to identify chemicals as carcinogens, co-carcinogens, or tumor promoters (HERL/L104B0702)

The contents of this table reflect information available as of August 1984.

TOXICOLOGY METHODS DEVELOPMENT

ENVIRONMENTAL PROTECTION AGENCY (Continued)

Methods	Area	Abbreviated Summary (Performing Organization and Project No.)
In vitro metabolic activation systems	Genetic Toxicity/ Carcinogenesis/ Mutagenesis	The objective is to obtain improved metabolic activation systems that activate and detoxify chemical carcinogens and mutagens in order to improve genetic toxicology bioassay systems which utilize metabolic activation. Includes an examination of major classes of chemical carcinogens and mutagens with regard to metabolism, detoxification, and metabolic activation pathways. Organ, species, and strain effects as well as effects of inducers on components of metabolic activation/detoxification pathways are applied to performance of genetic toxicology bioassays (HERL/L104B0703)
In vivo, *in vitro* cytogenetic tests for detecting chromosome damage	Genetic Toxicity/ Mutagenesis/ Carcinogenesis	The objectives are to expand and improve cytogenetic methods for evaluating genotoxic chemical effects and to characterize mechanisms, expressions, and sensitivities of induced chromosome aberrations and sister chromatid exchange frequencies. *In vitro* development includes rodent cell cultures with multiple activation and endpoint capabilities as well as both human and rodent lymphocyte systems incorporating chromosomal and gene-level criteria for monitoring damage. *In vivo* development includes use of rats, mice, and hamsters for species, strain, and tissue comparisons of carcinogen-induced cytogenetic damage (HERL/L104B0705)
Multi-end point mammalian cell mutation system	Genetic Toxicity/ Mutagenesis	The objective is to provide a test method to detect the mutagenic effects of toxic chemicals based on the L5178YTK +/- mouse lymphoma assay for detecting genetic damage. Cytogenetic analyses are used to determine if mutants deficient in thymidine kinase represent both single gene and chromosomal mutation. The assay also includes gross chromosomal aberrations and sister chromatid exchange. Specific compounds are tested in the multi-endpoint assay and results compared among the types of genetic damage measured (HERL/L104B0707)

The contents of this table reflect information available as of August 1984.

TOXICOLOGY METHODS DEVELOPMENT

ENVIRONMENTAL PROTECTION AGENCY (Continued)

Methods	Area	Abbreviated Summary (Performing Organization and Project No.)
Alternate reproductive and teratology bioassay systems	Reproductive Toxicity/ Teratogenesis	The objectives are to develop alternate reproductive toxicity tests and bioassays to accurately evaluate neonate critical organ function. Development involves identification of a labratory model that mimics the functions to be assayed. A series of agents are tested in the model system at varying dose levels, and the bioassay is independently verified at another laboratory (HERL/L104B0708)
In vivo, in vitro biochemical and physiological effects methods	Metabolic toxicity/ Neurological toxicity	The objective is to develop and improve methods for testing animals and for in vitro studies to determine biochemical and physiological effects of toxic agents. Specifically, methods to examine the effects of toxic substances on brain energy pathways, liver metabolism, whole animal physiology, and the developing endocrine system will be developed (HERL/L104B0714)
Bioassays for immune system toxicity	Immunological Toxicity	The objectives are to provide bioassays to screen and evaluate chemicals for immunotoxic effects based on resistance to bacterial and viral infections. Noninvasive assays of immunotoxicity in animals are correlated to human immunotoxicity endpoints. The bioassays will be validated for use as screening methods for immunotoxicity (HERL/L104B0710)
In vivo, in vitro methods to detect neurotoxicity	Neurotoxicity/ Neurobehavior	The objective is to develop and validate neurobiological methods for cost effective and sensitive testing of neurotoxicity based on a multidisciplinary approach using neurophysiological, behavioral, neurochemical and neuropathological techniques (HERL/L104B0711)

The contents of this table reflect information available as of August 1984.

TOXICOLOGY METHODS DEVELOPMENT

ENVIRONMENTAL PROTECTION AGENCY (Continued)

Methods	Area	Abbreviated Summary (Performing Organization and Project No.)
Structure activity relationship methods to predict genetic toxicity	Genetic Toxicity/ Carcinogenesis/ Mutagenesis	The objective is the development of structure activity relationship methods and scientific data bases which will allow an accurate prediction of the carcinogenic and mutagenic effects of chemicals based on structural, physiochemical, topographical, mechanistic, and electronic parameters HERL/L104C0201)
Molecular electrostatic interaction potentials as a screening technique for untested chemicals	Toxic Screening	The objectives are to determine what characteristics of molecular electrostatic interaction potentials may be useful as a premanufacture screen of potentially toxic substances and to determine to what extent these characteristics may be used for that purpose in other more complicated structure activity relationship schemes (HERL/L104C0202)
Short-term *in vitro*, *in vivo* bioassay	Carcinogenesis	The objective is to develop and validate new approaches to assessing cancer risk. Human carcinogens with established epidemiological links are bioassayed for potency data and both bioassay potency and unit risks are cross-compared to each other to evaluate the comparative potency approach for use with single chemicals (HERL/L104G0101)
In vitro, *in vivo* germ cell multi-test systems	Genetic Toxicity/ Carcinogenesis/ Mutagenesis	The objective is to develop test systems specifically aimed at assessing gene and chromosomal effects in germ cells after exposure to mutagens and carcinogens. Cytogenetic methods are based on sister chromatid exchanges and meiotic crossover exchange. Immunological procedures involve antibody production against sperm enzymes (HERL/L104G0102)

The contents of this table reflect information available as of August 1984.

TOXICOLOGY METHODS DEVELOPMENT

ENVIRONMENTAL PROTECTION AGENCY (Continued)

Methods	Area	Abbreviated Summary (Performing Organization and Project No.)
Short-term bioassay comparative potency methods	Mutagenesis	The objective is to develop comparative potency methods to assess the potential cancer risk from hazardous air pollutants which are complex source emissions, and to develop strategies for assessing the mutagenicity of indoor and outdoor air (HERL/A109C1101)
In vitro and in vivo assays to evaluate the effects of mixtures of drinking water contaminants	Target Organ Toxicology	The objective is to develop and validate methods for assessing the effects of mixtures of organic compounds on renal and hepatic toxicity for extrapolation to low doses near ambient levels. The interactions between chemicals will be characterized as additive, synergistic, or antagonistic (HERL/C104A1002)
In vitro, in vivo bioassay prescreening of hazardous wastes	Acute Toxicity/ Genotoxicity/ Teratogenesis/ Neurotoxicity/ Immunotoxicity/ Systemic/Organ Toxicity	The objective is to provide a rapid, sensitive, reliable, inexpensive qualitative screening protocol (pre-screen) for use in identifying biologically active RCRA materials (raw wastes, leachates, etc.). The prescreen will combine currently available in vivo and in vitro test methods in the areas of general toxicology, mutagenesis, carcinogenesis, neurotoxicology, immunotoxicology, reproductive toxicology and teratology (HERL/D109C0101)

The contents of this table reflect information available as of August 1984.

TOXICOLOGY METHODS DEVELOPMENT

ENVIRONMENTAL PROTECTION AGENCY (Continued)

Methods	Area	Abbreviated Summary (Performing Organization and Project No.)
In vivo, in vitro mutageneticity test battery for human risk estimation	Genetic Toxicity/ Carcinogenesis/ Mutagenesis	The objective is to develop, validate, and implement techniques for determining genetic effects of human exposure to chemical carcinogens and mutagens by means of quantitative correlation of animal and human dose-effect information (HERL/L104G0103)
In vivo, interspecies significance of toxicology test data	Metabolic Toxicity/ Cardiovascular Toxicity/Endocrine Toxicity	The objective is to gain a better understanding of the interspecies significance of toxicology test data and to assess the effects of hepatic, cardiovascular, and hormonal alterations on the general health of the animal to provide a rational basis for the extrapolation of laboratory-derived toxicological data to the human population (HERL/L104G0104)
In vivo, predictive mathematical extrapolation model	Pulmonary Toxicity	The objectives are to obtain better input data for theoretical respiratory uptake models by developing accurate morphometric data on the pulmonary acinus region in animals and humans and to utilize three-dimensional reconstruction data to study deposition of particles in human and animal lungs (HERL/L104G0105)
In vivo evaluation of significance of neurotoxic response indicators	Neurotoxicity	The objective is to determine the relationship of indicators of neurotoxicity to disease states and/or neurobehavioral dysfunction based on a broad array of neurochemical, anatomical, electrophysiological and behavioral tests (HERL/L104G0106)
In vivo, in vitro bioassay	Mutagenesis/ Carcinogenesis	The objective is to develop a comparative potency method for assessing cancer risk from source emissions and to evaluate and quantify the contribution of various source emissions to the mutagenicity and cancer risk of air pollution (HERL/A109C0502)

134<

The contents of this table reflect information available as of August 1984.

CHEMICAL COMPOUNDS CURRENTLY BEING TESTED BY DHHS, DOE, AND EPA FOR TOXICOLOGICAL PROPERTIES

INTRODUCTION TO TABLES AND INDEXES

The tables are organized as in the previous reports. The grouping of tests is that which was provided by the agency to NTP. The names of chemicals are those given by the agencies, and range from generic, trade and trivial names to systematic nomenclature. The Chemical Abstracts Registry (CAS) Numbers have been located for most of the chemicals that have CAS Numbers; they assist the user to locate a chemical regardless of the particular name used by the agencies.

There are three indexes: Chemical Index (by name), CAS Registry Number Index, and the Study Type Index. The first and third indexes which are alphabetical also give the CAS Registry Number.

Both the Tables and Indexes are arranged by a chemical sorting program which ignores single letters and numbers in sequencing the names, and the result is a logical sequence of names.

The Study Type Index is divided into the following categories:

1. Biochemical/Cellular/Tissue Effects (includes general biochemistry, pathology, and toxic mechanisms at molecular, cellular and tissue levels)
2. Clinical Toxicology/Epidemiology (human and animal)
3. Carcinogenesis Studies
4. Chronic Toxicity* (includes general toxicology, adverse effects, side effects)
5. Immunologic Toxicity
6. Mutagenesis/Genetic Toxicity
7. Neurologic/Behavioral Toxicity
8. Nutritional Studies
9. Pharmacokinetics/Metabolism (of xenobiotics and their fate in biological systems; includes general pharmacology)
10. Pulmonary Toxicity
11. Reproductive/Developmental Toxicity
12. Subchronic Toxicity* (includes general toxicology, adverse effects, side effects)
13. Systemic/Organ Toxicity and Physiologic Systems (except Reproductive/Pulmonary/Immunologic Systems)

We recommend that the user enter these Tables by checking both the Chemical Name and CAS Registry Number Indexes, since agencies often use different names to describe the same chemical. If a desired chemical is not located under a given CAS Registry Number, one should check with CHEMLINE or a similar system to be sure that a new CAS Registry Number has not been assigned to that chemical.

If the user identifies any errors or inaccurate entries, he is requested to call them to the attention of Dr. Larry Hart, National Toxicology Program, P.O. Box 12233, Research Triangle Park, NC 27709, so that they may be corrected in the next edition of this compilation.

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*By definition, "chronic studies" are greater than six months in duration while "subchronic studies" are six months or less in duration.

TOXICOLOGY TESTING

NATIONAL CANCER INSTITUTE
DIVISION OF CANCER CAUSE AND PREVENTION
STRUCTURE ACTIVITY, BASIC STUDIES

CHEMICAL	CAS NO.	TEST TYPE	STATUS	PERFORMING ORGANIZATION/PROJECT NO.
ACETALDOXIME	107-29-9	CARCINOGENESIS	A	FCRC/N01-CP-75380
ACRALDEHYDE DIETHYLACETAL	3054-95-3	CARCINOGENESIS	A	FCRC/N01-CP-75380
ACRALDEHYDE OXIME	5314-33-0	CARCINOGENESIS	A	FCRC/N01-CP-75380
ACROLEIN	107-02-8	CARCINOGENESIS	A	FCRC/N01-CP-75380
ALLYL ALCOHOL	107-18-6	CARCINOGENESIS	A	FCRC/N01-CP-75380
N-AMINOPROLINE	10139-05-6	CARCINOGENESIS	A	FCRC/N01-CP-75380
N-AMINOPYRROLIDINE	16596-41-1	CARCINOGENESIS	A	FCRC/N01-CP-75380
3-CHLORONITROSOPIPERIDINE	65445-60-5	CARCINOGENESIS	A	FCRC/N01-CP-75380
4-CHLORONITROSOPIPERIDINE	65445-61-6	CARCINOGENESIS	A	FCRC/N01-CP-75380
4-CYCLOHEXYLNITROSOPIPERIDINE	75881-21-9	CARCINOGENESIS	A	FCRC/N01-CP-75380
DIETHYLNITROSAMINE	55-18-5	CARCINOGENESIS	A	FCRC/N01-CP-75380
DIETHYLNITROSAMINE-F6		CARCINOGENESIS	A	FCRC/N01-CP-75380
DIETHYLNITROSOMETHYL-D3-UREA		CARCINOGENESIS	A	FCRC/N01-CP-75380
DIETHYLNITROSOMETHYLUREA		CARCINOGENESIS	A	FCRC/N01-CP-75380
2,6-DIMETHYLDINITROSOPIPERAZINE	55380-34-2	CARCINOGENESIS	A	FCRC/N01-CP-75380
2,6-DIMETHYLDINITROSOPIPERAZINE-D4		CARCINOGENESIS	A	FCRC/N01-CP-75380
2,6-DIMETHYLNITROSOMORPHOLINE	1456-28-6	CARCINOGENESIS	A	FCRC/N01-CP-75380
2,6-DIMETHYLNITROSOMORPHOLINE--D2		CARCINOGENESIS	A	FCRC/N01-CP-75380
2,6-DIMETHYLNITROSOMORPHOLINE--D4		CARCINOGENESIS	A	FCRC/N01-CP-75380
2,6-DIMETHYLNITROSOMORPHOLINE--ISOMER A	69091-15-2	CARCINOGENESIS	A	FCRC/N01-CP-75380
2,6-DIMETHYLNITROSOMORPHOLINE--ISOMER C	69091-16-3	CARCINOGENESIS	A	FCRC/N01-CP-75380
2,6-DIMETHYL-4-NITROSOPIPERAZINE	67774-31-6	CARCINOGENESIS	A	FCRC/N01-CP-75380
3,5-DIMETHYLNITROSOPIPERIDINE	65445-59-2	CARCINOGENESIS	A	FCRC/N01-CP-75380
3,5-DIMETHYLNITROSOPIPERIDINE--ISOMER A	78338-31-5	CARCINOGENESIS	A	FCRC/N01-CP-75380
3,5-DIMETHYLNITROSOPIPERIDINE--ISOMER B	78338-32-6	CARCINOGENESIS	A	FCRC/N01-CP-75380
DINITROSOHOMOPIPERAZINE	55557-00-1	CARCINOGENESIS	A	FCRC/N01-CP-75380
3,4-EPOXYNITROSOPIPERIDINE		CARCINOGENESIS	A	FCRC/N01-CP-75380
ETHYLAZOXYETHANE		CARCINOGENESIS	A	NCI-FCRF
ETHYLAZOXYMETHANE		CARCINOGENESIS	A	FCRC/N01-CP-75380
METHYLAZOXYETHANE		CARCINOGENESIS	A	FCRC/N01-CP-75380
METHYLAZOXYMETHANE		CARCINOGENESIS	A	FCRC/N01-CP-75380
METHYLAZOXYMETHANE-D3		CARCINOGENESIS	A	FCRC/N01-CP-75380
2-METHYLNITROSOMORPHOLINE	75881-16-2	CARCINOGENESIS	A	FCRC/N01-CP-75380
2-METHYLNITROSO-1,3-OXAZOLIDINE	39884-53-2	CARCINOGENESIS	A	FCRC/N01-CP-75380
5-METHYLNITROSO-1,3-OXAZOLIDINE	35631-27-7	CARCINOGENESIS	A	FCRC/N01-CP-75380

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TOXICOLOGY TESTING

NATIONAL CANCER INSTITUTE
DIVISION OF CANCER CAUSE AND PREVENTION
STRUCTURE ACTIVITY, BASIC STUDIES

CHEMICAL	CAS NO.	TEST TYPE	STATUS	PERFORMING ORGANIZATION/PROJECT NO.
3-METHYLNITROSO-4-PIPERIDONE		CARCINOGENESIS	A	FCRC/N01-CP-75380
NITROSO-2-ACETOXYDIBENZYLAMINE		CARCINOGENESIS	A	FCRC/N01-CP-75380
NITROSO-4-ACETYL-3,5-DIMETHYLPIPERAZINE	75881-17-3	CARCINOGENESIS		FCRC/N01-CP-75380
NITROSOALLYLETHANOLAMINE		CARCINOGENESIS	A	FCRC/N01-CP-75380
NITROSOALLYL-2-HYDROXYPROPYLAMINE		CARCINOGENESIS	A	FCRC/N01-CP-75380
1-NITROSO-4-BENZOYL-3,5-DIMETHYLPIPERAZINE	61034-40-0	CARCINOGENESIS	A	FCRC/N01-CP-75380
NITROSOBIS-(2-HYDROXYPROPYL)-AMINE		CARCINOGENESIS	A	FCRC/N01-CP-75380
NITROSO-BIS-(2-OXOPROPYL)-AMINE	60599-38-4	CARCINOGENESIS	B	FCRC/N01-CP-75380
1-NITROSO-1-(2-CHLOROETHYL)-3--(2-HYDROXYETHYL)-UREA		CARCINOGENESIS MUTAGENESIS/GENETIC TOXICITY	A	NCI-FCRF
1-NITROSO-1-(2-CHLOROETHYL)-3--(2-HYDROXYPROPYL)-UREA		CARCINOGENESIS MUTAGENESIS/GENETIC TOXICITY	A	NCI-FCRF
NITROSOCIMETIDINE	73785-40-7	CARCINOGENESIS	A	FCRC/N01-CP-75380
NITROSODI-N-BUTYLAMINE	924-16-3	CARCINOGENESIS	A	FCRC/N01-CP-75380
NITROSODIETHANOLAMINE	1116-54-7	CARCINOGENESIS	B	FCRC/N01-CP-75380
NITROSODIHYDROXYPROPYLALLYLAMINE		CARCINOGENESIS	A	FCRC/N01-CP-75380
NITROSODIHYDROXYPROPYLETHANOLAMINE		CARCINOGENESIS	A	FCRC/N01-CP-75380
NITROSODIHYDROXYPROPYL-2-HYDROXYPROPYLAMINE		CARCINOGENESIS	A	FCRC/N01-CP-75380
NITROSODIHYDROXYPROPYLOXOPROPYLAMINE		CARCINOGENESIS	A	FCRC/N01-CP-75380
NITROSODIISOBUTYLAMINE	997-95-5	CARCINOGENESIS	A	FCRC/N01-CP-75380
NITROSODIMETHYLAMINE	62-75-9	CARCINOGENESIS	A	FCRC/N01-CP-75380
NITROSODI-N-PROPYLAMINE	621-64-7	CARCINOGENESIS	A	FCRC/N01-CP-75380
NITROSODITHIAZINE		CARCINOGENESIS	A	FCRC/N01-CP-75380
NITROSOETHANOLISOPROPANOLAMINE		CARCINOGENESIS	B	FCRC/N01-CP-75380
NITROSOETHYLUREA	759-73-9	CARCINOGENESIS	A	FCRC/N01-CP-75380
NITROSOETHYL-D5-URETHANE		CARCINOGENESIS	B	NCI-FCRF
1-NITROSO-1-ETHYL-3-(2-HYDROXYETHYL)-UREA		CARCINOGENESIS	A	FCRC/N01-CP-75380

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NATIONAL CANCER INSTITUTE
DIVISION OF CANCER CAUSE AND PREVENTION
STRUCTURE ACTIVITY, BASIC STUDIES

CHEMICAL	CAS NO.	TEST TYPE	STATUS	PERFORMING ORGANIZATION/PROJECT NO.
		MUTAGENESIS/GENETIC TOXICITY	A	NCI-FCRF
NITROSOETHYLURETHANE	614-95-9	CARCINOGENESIS	A	FCRC/N01-CP-75380
NITROSOHEPTAMETHYLENEIMINE	20917-49-1	CARCINOGENESIS	A	FCRC/N01-CP-75380
NITROSOHEPTAMETHYLENEIMINE-D4		CARCINOGENESIS	A	FCRC/N01-CP-75380
NITROSOHEXAMETHYLENEIMINE	932-83-2	CARCINOGENESIS	A	FCRC/N01-CP-75380
1-NITROSO-1-(2-HYDROXYETHYL)-3-(2-CHLOROETHYL)-UREA		CARCINOGENESIS	B	
		MUTAGENESIS/GENETIC TOXICITY	A	NCI-FCRF
1-NITROSO-1-(2-HYDROXYETHYL)-3-ETHYLUREA		CARCINOGENESIS		
		MUTAGENESIS/GENETIC TOXICITY	A	NCI-FCRF
NITROSO-2-HYDROXYETHYLUREA	13743-07-2	CARCINOGENESIS	B	FCRC/N01-CP-75380
NITROSOHYDROXYMETHYLOXAZOLIDONE		CARCINOGENESIS	A	FCRC/N01-CP-75380
1-NITROSO-1-(2-HYDROXYPROPYL)-3-(2-CHLOROETHYL)-UREA		CARCINOGENESIS	B	
		MUTAGENESIS/GENETIC TOXICITY	A	NCI-FCRF
NITROSOHYDROXYPROPYLOXOPROPYLAMINE	61499-28-3	CARCINOGENESIS	A	FCRC/N01-CP-75380
NITROSO-2-HYDROXYPROPYLUREA	71752-69-7	CARCINOGENESIS	A	FCRC/N01-CP-75380
NITROSOMETHYLANILINE	614-00-6	CARCINOGENESIS	A	FCRC/N01-CP-75380
NITROSOMETHYLBENZYLAMINE	937-40-6	CARCINOGENESIS	A	FCRC/N01-CP-75380
NITROSOMETHYL-N-BUTYLAMINE	7068-83-9	CARCINOGENESIS	A	FCRC/N01-CP-75380
NITROSOMETHYL-N-BUTYL(1-D2)-AMINE		CARCINOGENESIS	A	FCRC/N01-CP-75380
NITROSOMETHYLCARBOXYPROPYLAMINE		CARCINOGENESIS	A	FCRC/N01-CP-75380
NITROSOMETHYL-3-CARBOXYPROPYLAMINE		CARCINOGENESIS	B	FCRC/N01-CP-75380
NITROSOMETHYLCYCLOHEXYLAMINE	5432-28-0	CARCINOGENESIS	A	FCRC/N01-CP-75380
NITROSOETHYLCYCLOHEXYLAMINE		CARCINOGENESIS	B	FCRC/N01-CP-75380
NITROSOMETHYLCYCLOHEXYLAMINE-D3		CARCINOGENESIS	A	FCRC/N01-CP-75380
NITROSOMETHYL-N-DECYLAMINE	7516-82-7	CARCINOGENESIS	A	FCRC/N01-CP-75380
NITROSOMETHYL-2,3-DIHYDROXYPROPYLAMINE		CARCINOGENESIS	A	FCRC/N01-CP-75380
NITROSOMETHYLDODECYLAMINE	55090-44-3	CARCINOGENESIS	A	FCRC/N01-CP-75380
NITROSOMETHYLDODECYLAMINE-D2		CARCINOGENESIS	A	FCRC/N01-CP-75380
NITROSOMETHYLDODECYLAMINE-D3		CARCINOGENESIS	A	FCRC/N01-CP-75380
NITROSOMETHYL-D3-N-BUTYLAMINE		CARCINOGENESIS	A	FCRC/N01-CP-75380
NITROSO-METHYL-D3-URETHANE		CARCINOGENESIS	A	FCRC/N01-CP-75380
NITROSOMETHYLETHYLAMINE	10595-95-6	CARCINOGENESIS	A	FCRC/N01-CP-75380
NITROSOMETHYLETHYLAMINE-D-8		CARCINOGENESIS	A	FCRC/N01-CP-75380
NITROSOMETHYLETHYLAMINE-D2		CARCINOGENESIS	A	FCRC/N01-CP-75380
NITROSOMETHYLETHYLAMINE-D3		CARCINOGENESIS	A	FCRC/N01-CP-75380
NITROSOMETHYLETHYLAMINE-D5		CARCINOGENESIS	A	FCRC/N01-CP-75380
NITROSOMETHYLETHYL-(2-D3)-AMINE		CARCINOGENESIS	A	FCRC/N01-CP-75380

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TOXICOLOGY TESTING

NATIONAL CANCER INSTITUTE
DIVISION OF CANCER CAUSE AND PREVENTION
STRUCTURE ACTIVITY, BASIC STUDIES

CHEMICAL	CAS NO.	TEST TYPE	STATUS	PERFORMING ORGANIZATION/PROJECT NO.
NITROSOMETHYL-4-FLUOROANILINE	937-25-7	CARCINOGENESIS	A	FCRC/NO1-CP-75380
NITROSOMETHYL-N-HEPTYLAMINE	16338-99-1	CARCINOGENESIS	A	FCRC/NO1-CP-75380
NITROSOMETHYL-N-HEXYLAMINE	28538-70-7	CARCINOGENESIS	A	FCRC/NO1-CP-75380
NITROSOMETHYL-2-HYDROXYPROPYLAMINE		CARCINOGENESIS	A	FCRC/NO1-CP-75380
NITROSOMETHYLNEOPENTYLAMINE	13256-07-0	CARCINOGENESIS	A	FCRC/NO1-CP-75380
NITROSOMETHYL-4-NITROANILINE	943-41-9	CARCINOGENESIS	A	FCRC/NO1-CP-75380
NITROSOMETHYLNITROGUANIDINE	70-25-7	CARCINOGENESIS	A	FCRC/NO1-CP-75380
NITROSOMETHYL-N-NONYLAMINE	75881-19-5	CARCINOGENESIS	A	FCRC/NO1-CP-75380
NITROSOMETHYL-N-OCTYLAMINE	34423-54-6	CARCINOGENESIS	B	FCRC/NO1-CP-75380
NITROSO-5-METHYLOXAZOLIDONE	35631-27-7	CARCINOGENESIS	A	FCRC/NO1-CP-75380
NITROSOMETHYL-2-OXOPROPYLAMINE		CARCINOGENESIS	B	FCRC/NO1-CP-75380
NITROSOMETHYLPHENYLETHYLAMINE	13256-11-6	CARCINOGENESIS	A	FCRC/NO1-CP-75380
NITROSOMETHYLPHENYLETHYLAMINE--D2		CARCINOGENESIS	A	FCRC/NO1-CP-75380
NITROSOMETHYLPHENYLETHYLAMINE--D3		CARCINOGENESIS	A	FCRC/NO1-CP-75380
NITROSO-3-METHYL-DELTA-3-PIPERIDINE	75881-15-1	CARCINOGENESIS	A	FCRC/NO1-CP-75380
NITROSOMETHYL-N-PROPYLAMINE	924-46-9	CARCINOGENESIS	A	FCRC/NO1-CP-75380
NITROSOMETHYL-N-TETRADECYLAMINE	75881-2U-8	CARCINOGENESIS	A	FCRC/NO1-CP-75380
NITROSOMETHYL-2-TRIFLUOROETHYLAMINE	819-35-2	CARCINOGENESIS	A	FCRC/NO1-CP-75380
NITROSOMETHYLUREA	684-93-5	CARCINOGENESIS	A	FCRC/NO1-CP-75380
NITROSOMETHYLURETHANE	615-53-2	CARCINOGENESIS	A	FCRC/NO1-CP-75380
NITROSOMORPHOLINE		CARCINOGENESIS	B	FCRC/NO1-CP-75380
NITROSO-1,3-OXAZOLIDINE	39884-52-1	CARCINOGENESIS	A	FCRC/NO1-CP-75380
NITROSOOXAZOLIDONE	38347-74-9	CARCINOGENESIS	A	FCRC/NO1-CP-75380
NITROSOOXOPROPYLALLYLAMINE		CARCINOGENESIS	A	FCRC/NO1-CP-75380
NITROSOOXOPROPYLETHANOLAMINE		CARCINOGENESIS	A	FCRC/NO1-CP-75380
NITROSOPIPERIDINE	100-75-4	CARCINOGENESIS	A	FCRC/NO1-CP-75380
NITROSO-DELTA-2-PIPERIDINE	70501-82-5	CARCINOGENESIS	A	FCRC/NO1-CP-75380
NITROSO-4-PIPERIDONE	55556-91-7	CARCINOGENESIS	A	FCRC/NO1-CP-75380
NITROSOPYRROLIDINE	930-55-2	CARCINOGENESIS	A	FCRC/NO1-CP-75380
NITROSOTETRAHYDRO-1,3-OXAZINE	40548-68-3	CARCINOGENESIS	A	FCRC/NO1-CP-75380
NITROSOTETRAHYDROPYRIDINE	55556-92-8	CARCINOGENESIS	A	FCRC/NO1-CP-75380
NITROSOTHIALDINE		CARCINOGENESIS	B	FCRC/NO1-CP-75380
NITROSOTHIAZOLIDINE		CARCINOGENESIS	B	NCI-FCRF

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TOXICOLOGY TESTING

NATIONAL CANCER INSTITUTE
DIVISION OF CANCER CAUSE AND PREVENTION
STRUCTURE ACTIVITY, BASIC STUDIES

CHEMICAL	CAS NO.	TEST TYPE	STATUS	PERFORMING ORGANIZATION/PROJECT NO.
NITROSO-3,4,5-TRIMETHYLPIPERAZINE	75881-18-4	CARCINOGENESIS	A	FCRC/N01-CP-75380
4-PHENYLNITROSOPIPERIDINE	6652-04-6	CARCINOGENESIS	A	FCRC/N01-CP-75380
4-TERTIARY-BUTYL-NITROSOPIPERIDINE	46061-25-0	CARCINOGENESIS	A	FCRC/N01-CP-75380
TRIETHYLNITROSOUREA	50285-70-6	CARCINOGENESIS	A	FCRC/N01-CP-75380
TRIMETHYLNITROSOUREA	3475-63-6	CARCINOGENESIS	A	FCRC/N01-CP-75380
VINYL ACETATE	108-05-4	CARCINOGENESIS	A	FCRC/N01-CP-75380

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STRUCTURE ACTIVITY, ADDITIVE STUDIES

CHEMICAL	CAS NO.	TEST TYPE	STATUS	PERFORMING ORGANIZATION/PROJECT NO.
DIETHYLNITROSAMINE WITH NITROSOMETHYLETHYLAMINE	55-18-5 10595-95-6	CARCINOGENESIS	A	FCRC/N01-CP-75380
DIETHYLNITROSAMINE WITH NITROSOMETHYLETHYLAMINE WITH DIMETHYLDINITROSOPIPERAZINE	55-18-5 10595-95-6 55380-34-2	CARCINOGENESIS	A	FCRC/N01-CP-75380
DIETHYLNITROSAMINE WITH NITROSOMETHYLDODECYLAMINE	55-18-5 55090-44-3	CARCINOGENESIS	A	FCRC/N01-CP-75380
NITROSOMETHYLETHYLAMINE WITH DIMETHYLDINITROSOPIPERAZINE	10595-95-6 55380-34-2	CARCINOGENESIS	A	FCRC/N01-CP-75380
NITROSOMETHYLETHYLAMINE WITH NITROSOMETHYLURETHANE	10595-95-6 615-53-2	CARCINOGENESIS	A	FCRC/N01-CP-75380
NITROSOMETHYLETHYLAMINE WITH DIMETHYLDINITROSOPIPERAZINE WITH NITROSOMETHYLURETHANE	10595-95-6 55380-34-2 615-53-2	CARCINOGENESIS	A	FCRC/N01-CP-75380

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TOXICOLOGY TESTING

NATIONAL CANCER INSTITUTE
DIVISION OF CANCER CAUSE AND PREVENTION
STRUCTURE ACTIVITY, GUINEA PIGS

CHEMICAL	CAS NO.	TEST TYPE	STATUS	PERFORMING ORGANIZATION/PROJECT NO.
DIETHYLNITROSOMETHYLUREA		CARCINOGENESIS	A	FCRC/N01-CP-75380
2,6-DIMETHYLDINITROSOPIPERAZINE	55380-34-2	CARCINOGENESIS	A	FCRC/N01-CP-75380
2,6-DIMETHYLNITROSOMORPHOLINE	1456-28-6	CARCINOGENESIS	A	FCRC/N01-CP-75380
METHAPYRILENE HYDROCHLORIDE	135-23-9	CARCINOGENESIS	A	FCRC/01-CP-75380
NITROSOETHYLURETHANE	614-95-9	CARCINOGENESIS	A	FCRC/N01-CP-75380
NITROSOHEPTAMETHYLENEIMINE	20917-49-1	CARCINOGENESIS	A	FCRC/N01-CP-75380
NITROSOMETHYLDODECYLAMINE	55090-44-3	CARCINOGENESIS	A	FCRC/N01-CP-75380
OLIVE OIL		CARCINOGENESIS	A	FCRC/N01-CP-75380

143<

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TOXICOLOGY TESTING

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DIVISION OF CANCER CAUSE AND PREVENTION
STRUCTURE ACTIVITY, FEEDING STUDIES WITH NITRITE

CHEMICAL	CAS NO.	TEST TYPE	STATUS	PERFORMING ORGANIZATION/PROJECT NO.
ALLANTOIN	97-59-6	CARCINOGENESIS	A	FCRC/N01-CP-75380
ALLANTOIN WITH NITRITE	97-59-6 14797-65-0	CARCINOGENESIS	A	FCRC/N01-CP-75380
CHLORDIAZEPOXIDE WITH NITRITE	58-25-3 14797-65-0	CARCINOGENESIS	A	FCRC/N01-CP-75380
CHLOROTHEN	148-65-2	CARCINOGENESIS	A	FCRC/N01-CP-75380
CHLORPHENIRAMINE MALEATE	113-92-8	CARCINOGENESIS	A	FCRC/N01-CP-75380
CHLORPHENIRAMINE MALEATE WITH NITRITE	113-92-8 14797-65-0	CARCINOGENESIS	A	FCRC/N01-CP-75380
DIMETHYLDODECYLAMINE OXIDE WITH NITRITE	1643-20-5 14797-65-0	CARCINOGENESIS	A	FCRC/N01-CP-75380
DIMETHYLDODECYLAMINE OXIDE	1643-20-5	CARCINOGENESIS	A	FCRC/N01-CP-75380
DIPHENHYDRAMINE HYDROCHLORIDE	147-24-0	CARCINOGENESIS	A	FCRC/N01-CP-75380
DIPHENHYDRAMINE HYDROCHLORIDE WITH NITRITE	147-24-0 14797-65-0	CARCINOGENESIS	A	FCRC/N01-CP-75380
DISULFIRAM WITH NITRITE	97-77-8 14797-65-0	CARCINOGENESIS	A	FCRC/N01-CP-75380
HYDROCHLOROTHIAZIDE	58-93-5	CARCINOGENESIS	A	FCRC/N01-CP-75380
HYDROCHLOROTHIAZIDE WITH NITRITE	58-93-5 14797-65-0	CARCINOGENESIS	A	FCRC/N01-CP-75380
METHAFURYLENE	531-06-6	CARCINOGENESIS	A	FCRC/N01-CP-75380
METHAPHENILENE	493-78-9	CARCINOGENESIS	B	NCI-FCRF
METHAPYRILENE	91-80-5	CARCINOGENESIS	A	FCRC/N01-CP-75380
METHAPYRILENE WITH NITRITE	91-80-5 14797-65-0	CARCINOGENESIS	A	FCRC/N01-CP-75380
MONURON WITH NITRITE	150-68-5 14797-65-0	CARCINOGENESIS	A	FCRC/N01-CP-75380
PIPERINE WITH NITRITE	94-62-2 14797-65-0	CARCINOGENESIS	A	FCRC/N01-CP-75380
PYRILAMINE MALEATE	59-33-6	CARCINOGENESIS	A	FCRC/N01-CP-75380
QUINACRINE WITH NITRITE	83-89-6 14797-65-0	CARCINOGENESIS	A	FCRC/N01-CP-75380
QUINACRINE	83-89-6	CARCINOGENESIS	A	FCRC/N01-CP-75380
SODIUM NITRITE	7632-00-0	CARCINOGENESIS	A	FCRC/N01-CP-75380
THENYLDIAMINE	91-79-2	CARCINOGENESIS	A	FCRC/N01-CP-75380

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TOXICOLOGY TESTING

NATIONAL CANCER INSTITUTE
DIVISION OF CANCER CAUSE AND PREVENTION
STRUCTURE ACTIVITY, FEEDING STUDIES WITH NITRITE

CHEMICAL	CAS NO.	TEST TYPE	STATUS	PERFORMING ORGANIZATION/PROJECT NO.
THIRAM	137-26-8			
WITH NITRITE	14797-65-0	CARCINOGENESIS	A	FCRC/N01-CP-75380
TOLBUTAMIDE	64-77-7			
WITH NITRITE	14797-65-0	CARCINOGENESIS	A	FCRC/N01-CP-75380

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TOXICOLOGY TESTING

NATIONAL CANCER INSTITUTE
DIVISION OF CANCER CAUSE AND PREVENTION
STRUCTURE ACTIVITY, IN VIVO TRANSNITROSATION

CHEMICAL	CAS NO.	TEST TYPE	STATUS	PERFORMING ORGANIZATION/PROJECT NO.
MORPHOLINE HYDROCHLORIDE	10024-89-2	CARCINOGENESIS	A	FCRC/N01-CP-75380
MORPHOLINE HYDROCHLORIDE	10024-89-2	CARCINOGENESIS	A	FCRC/N01-CP-75380
MORPHOLINE NITROSOHYDROXYPROLINE SALT		CARCINOGENESIS	A	FCRC/N01-CP-75380
MORPHOLINE NITROSOHYDROXYPROLINE SALT WITH SODIUM THIOCYANATE	540-72-7	CARCINOGENESIS	A	FCRC/N01-CP-75380
MORPHOLINE NITROSOPROLINE SALT		CARCINOGENESIS	A	FCRC/N01-CP-75380
MORPHOLINE NITROSOPROLINE SALT WITH SODIUM THIOCYANATE	540-72-7	CARCINOGENESIS	A	FCRC/N01-CP-75380
NITROSOHYDROXYPROLINE	30310-80-6	CARCINOGENESIS	A	FCRC/N01-CP-75380
NITROSOMETHYLPIPERAZINE WITH MORPHOLINE HYDROCHLORIDE	109-01-3 10024-89-2	CARCINOGENESIS	A	FCRC/N01-CP-75380
NITROSOMETHYLPIPERAZINE WITH MORPHOLINE HYDROCHLORIDE WITH SODIUM THIOCYANATE	109-01-3 10024-89-2 540-72-7	CARCINOGENESIS	A	FCRC/N01-CP-75380
NITROSOMETHYLPIPERAZINE	109-01-3	CARCINOGENESIS	A	FCRC/N01-CP-75380
NITROSOMORPHOLINE	59-89-2	CARCINOGENESIS	A	FCRC/N01-CP-75380
NITROSOPHENYLBENZYLAMINE	612-98-6	CARCINOGENESIS	A	FCRC/N01-CP-75380
NITROSOPHENYLBENZYLAMINE WITH MORPHOLINE HYDROCHLORIDE	612-98-6 10024-89-2	CARCINOGENESIS	A	FCRC/N01-CP-75380
NITROSOPHENYLBENZYLAMINE WITH MORPHOLINE WITH SODIUM THIOCYANATE	612-98-6 110-91-8 540-72-7	CARCINOGENESIS	A	FCRC/N01-CP-75380
NITROSOPROLINE	55514-93-7	CARCINOGENESIS	A	FCRC/N01-CP-75380
NITROSOPROLINE WITH SODIUM THIOCYANATE	55514-93-7 540-72-7	CARCINOGENESIS	A	FCRC/N01-CP-75380
SODIUM THIOCYANATE	540-72-7	CARCINOGENESIS	A	FCRC/N01-CP-75380
SODIUM THIOCYANATE WITH SODIUM NITRITE	540-72-7 7632-00-0	CARCINOGENESIS	B	NCI-FCRF

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TOXICOLOGY TESTING

NATIONAL CANCER INSTITUTE
DIVISION OF CANCER CAUSE AND PREVENTION
STRUCTURE ACTIVITY, MOUSE SKIN PAINTING STUDIES

CHEMICAL	CAS NO.	TEST TYPE	STATUS	PERFORMING ORGANIZATION/PROJECT NO.
1-BENZYL-1,3-DIMETHYLTRIAZENE	74649-41-5	CARCINOGENESIS	A	FCRC/N01-CP-75380
1-BENZYL-3,3-DIMETHYLTRIAZENE	74649-42-6	CARCINOGENESIS	A	FCRC/N01-CP-75380
2-BROMO-DMBA		CARCINOGENESIS	A	FCRC/N01-CP-75380
3-BROMO-DMBA		CARCINOGENESIS	A	FCRC/N01-CP-75380
4-BROMO-DMBA		CARCINOGENESIS	A	FCRC/N01-CP-75380
2-METHOXY-DMBA		CARCINOGENESIS	A	FCRC/N01-CP-75380
3-METHOXY-DMBA	66240-02-6	CARCINOGENESIS	A	FCRC/N01-CP-75380
4-METHOXY-DMBA	16277-49-9	CARCINOGENESIS	A	FCRC/N01-CP-75380
NITROSOALLYLUREA	760-56-5	CARCINOGENESIS	A	FCRC/N01-CP-75380
NITROSO-N-AMYLUREA	10589-74-9	CARCINOGENESIS	A	FCRC/N01-CP-75380
NITROSOBENZYLUREA	775-11-1	CARCINOGENESIS	A	FCRC/N01-CP-75380
NITROSO-N-BUTYLUREA	869-01-2	CARCINOGENESIS	A	FCRC/N01-CP-75380
NITROSO-SEC-BUTYLUREA	71752-66-4	CARCINOGENESIS	A	FCRC/N01-CP-75380
NITROSOCARBARYL	64158-97-0	CARCINOGENESIS	A	FCRC/N01-CP-75380
NITROSOCHLOROETHYLDIETHYLUREA	69113-00-4	CARCINOGENESIS	A	FCRC/N01-CP-75380
NITROSOCHLOROETHYLDIMETHYLUREA	59960-30-4	CARCINOGENESIS	A	FCRC/N01-CP-75380
NITROSOCIMETIDINE	73785-40-7	CARCINOGENESIS	A	FCRC/N01-CP-75380
NITROSOCYCLOHEXYLUREA	877-31-6	CARCINOGENESIS	A	FCRC/N01-CP-75380
NITROSOETHYLNITROGUANIDINE		CARCINOGENESIS	A	FCRC/N01-CP-75380
NITROSOETHYLNITROGUANIDINE-D5		CARCINOGENESIS	A	FCRC/N01-CP-75380
NITROSOETHYLUREA	759-73-9	CARCINOGENESIS	A	FCRC/N01-CP-75380
NITROSOETHYLUREA-D5		CARCINOGENESIS	A	FCRC/N01-CP-75380
NITROSOETHYLURETHANE	614-95-9	CARCINOGENESIS	A	FCRC/N01-CP-75380
NITROSO-2-FLUOROETHYLUREA	69112-98-7	CARCINOGENESIS	A	FCRC/N01-CP-75380
NITROSO-N-HEXYLUREA	18774-85-1	CARCINOGENESIS	A	FCRC/N01-CP-75380
NITROSO-2-HYDROXYETHYLUREA	13743-07-2	CARCINOGENESIS	A	FCRC/N01-CP-75380
NITROSO-2-HYDROXYPROPYLUREA	71752-69-7	CARCINOGENESIS	A	FCRC/N01-CP-75380
NITROSO-3-HYDROXYPROPYLUREA	71752-70-0	CARCINOGENESIS	A	FCRC/N01-CP-75380
NITROSOISOBUTYLUREA	760-60-1	CARCINOGENESIS	A	FCRC/N01-CP-75380
NITROSO-ISOPROPYLUREA	16830-14-1	CARCINOGENESIS	A	FCRC/N01-CP-75380
NITROSOMETHYLBIS-CHLOROETHYLUREA	69112-99-8	CARCINOGENESIS	A	FCRC/N01-CP-75380
NITROSOMETHYLNITROGUANIDINE	70-25-7	CARCINOGENESIS	A	FCRC/N01-CP-75380
NITROSOMETHYLNITROGUANIDINE-D3		CARCINOGENESIS	A	FCRC/N01-CP-75380
NITROSO-5-METHYLOXAZOLIDONE	35631-27-7	CARCINOGENESIS	A	FCRC/N01-CP-75380
NITROSOMETHYLUREA	684-93-5	CARCINOGENESIS	A	FCRC/N01-CP-75380
NITROSOMETHYLUREA-D3	68426-45-9	CARCINOGENESIS	A	FCRC/N01-CP-75380
NITROSOMETHYLURETHANE	615-53-2	CARCINOGENESIS	A	FCRC/N01-CP-75380
NITROSO-2-PHENYLETHYLUREA	777-79-7	CARCINOGENESIS	A	FCRC/N01-CP-75380
NITROSOPHENYLUREA	6268-32-2	CARCINOGENESIS	A	FCRC/N01-CP-75380
NITROSO-N-PROPYLUREA	816-57-9	CARCINOGENESIS	A	FCRC/N01-CP-75380
NITROSO-N-TRIDECYLUREA	71752-68-6	CARCINOGENESIS	A	FCRC/N01-CP-75380

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TOXICOLOGY TESTING

NATIONAL CANCER INSTITUTE
DIVISION OF CANCER CAUSE AND PREVENTION
STRUCTURE ACTIVITY, MOUSE SKIN PAINTING STUDIES

CHEMICAL	CAS NO.	TEST TYPE	STATUS	PERFORMING ORGANIZATION/PROJECT NO.
NITROSO-TRIS-CHLOROETHYLUREA	71162-64-6	CARCINOGENESIS	A	FCRC/NO1-CP-75380
NITROSO-N-UNDECYLUREA	71752-67-5	CARCINOGENESIS	A	FCRC/NO1-CP-75380
1,2,3,4-TETRAHYDRO-DMBA	67242-54-0	CARCINOGENESIS	A	FCRC/NO1-CP-75380

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TOXICOLOGY TESTING

NATIONAL CANCER INSTITUTE
DIVISION OF CANCER CAUSE AND PREVENTION
IN VITRO TESTING

CHEMICAL	CAS NO.	TEST TYPE	STATUS	PERFORMING ORGANIZATION/PROJECT NO.
ABIETIC ACID	514-10-3	MUTAGENESIS/GENETIC TOXICITY	A	MICROBIOLOGICAL ASSOCIATES/N01-CP-15739
ACETALDEHYDE	75-07-0	MUTAGENESIS/GENETIC TOXICITY	C	MICROBIOLOGICAL ASSOCIATES/N01-CP-41004
AMYL NITRATE	463-04-7	MUTAGENESIS/GENETIC TOXICITY	A	MICROBIOLOGICAL ASSOCIATES/N01-CP-15739
5-AZACYTIDINE	320-67-2	MUTAGENESIS/GENETIC TOXICITY	C	MICROBIOLOGICAL ASSOCIATES/N01-CP-41004
N,N-BIS(2-HYDROXYETHYL)-P-TOLUIDINE	3077-12-1	MUTAGENESIS/GENETIC TOXICITY	A	MICROBIOLOGICAL ASSOCIATES/N01-CP-15739
1,3-BUTADIENE	106-99-0	MUTAGENESIS/GENETIC TOXICITY	A	MICROBIOLOGICAL ASSOCIATES/N01-CP-15739
N-BUTYL NITRITE	544-16-1	MUTAGENESIS/GENETIC TOXICITY	A	MICROBIOLOGICAL ASSOCIATES/N01-CP-15739
SEC-BUTYL NITRITE	924-43-6	MUTAGENESIS/GENETIC TOXICITY	A	MICROBIOLOGICAL ASSOCIATES/N01-CP-15739
CAFFEIC ACID	331-39-5	MUTAGENESIS/GENETIC TOXICITY	A	MICROBIOLOGICAL ASSOCIATES/N01-CP-15739
CALCIUM NAPHTHENATE	61789-36-4	MUTAGENESIS/GENETIC TOXICITY	A	MICROBIOLOGICAL ASSOCIATES/N01-CP-15739
CARMINIC ACID	1260-17-9	MUTAGENESIS/GENETIC TOXICITY	C	MICROBIOLOGICAL ASSOCIATES/N01-CP-41004
CHAVICOL	501-92-8	MUTAGENESIS/GENETIC TOXICITY	A	MICROBIOLOGICAL ASSOCIATES/N01-CP-15739
P-CHLORO-ALPA,ALPHA, ALPHA-TRIFLUORO-TOLUENE	98-56-6	MUTAGENESIS/GENETIC TOXICITY	C	MICROBIOLOGICAL ASSOCIATES/N01-CP-41004
CHLOROGENIC ACID	327-97-1	MUTAGENESIS/GENETIC TOXICITY	B	MICROBIOLOGICAL ASSOCIATES/N01-CP-41004
CHOLESTEROL-5-ALPHA,6-ALPHA-EP-OXIDE	1250-95-9	MUTAGENESIS/GENETIC TOXICITY	A	MICROBIOLOGICAL ASSOCIATES/N01-CP-15739
CHOLESTYRAMINE	11041-12-6	MUTAGENESIS/GENETIC TOXICITY	C	MICROBIOLOGICAL ASSOCIATES/N01-CP-41004
CHROMIUM HEXACARBONYL	13007-92-6	MUTAGENESIS/GENETIC TOXICITY	A	MICROBIOLOGICAL ASSOCIATES/N01-CP-15739
C.I. ACID BLUE 74	860-22-0	MUTAGENESIS/GENETIC TOXICITY	A	MICROBIOLOGICAL ASSOCIATES/N01-CP-15739
C.I. ACID ORANGE 10	1936-15-8	MUTAGENESIS/GENETIC TOXICITY	A	MICROBIOLOGICAL ASSOCIATES/N01-CP-15739
C.I. ACID YELLOW 151	12715-61-6	MUTAGENESIS/GENETIC TOXICITY	C	MICROBIOLOGICAL ASSOCIATES/N01-CP-41004
C.I. BASIC RED 18	14097-03-1	MUTAGENESIS/GENETIC TOXICITY	C	MICROBIOLOGICAL ASSOCIATES/N01-CP-41004
C.I. DIRECT RED 80	2610-10-8	MUTAGENESIS/GENETIC TOXICITY	C	MICROBIOLOGICAL ASSOCIATES/N01-CP-41004
C.I. DIRECT YELLOW 4	91-34-9	MUTAGENESIS/GENETIC TOXICITY	C	MICROBIOLOGICAL ASSOCIATES/N01-CP-41004
C.I. DISPERSE BROWN 1	23355-64-8	MUTAGENESIS/GENETIC TOXICITY	C	MICROBIOLOGICAL ASSOCIATES/N01-CP-41004
C.I. SOLVENT ORANGE 7	3118-97-6	MUTAGENESIS/GENETIC TOXICITY	A	MICROBIOLOGICAL ASSOCIATES/N01-CP-15739
C.I. SOLVENT YELLOW 5	85-84-7	MUTAGENESIS/GENETIC TOXICITY	A	MICROBIOLOGICAL ASSOCIATES/N01-CP-15739
COBALT NAPHTHENATE	61789-51-3	MUTAGENESIS/GENETIC TOXICITY	B	MICROBIOLOGICAL ASSOCIATES/N01-CP-41004
COPPER NAPHTHENATE	1338-02-9	MUTAGENESIS/GENETIC TOXICITY	B	MICROBIOLOGICAL ASSOCIATES/N01-CP-41004
L-CYSTEINE	52-90-4	MUTAGENESIS/GENETIC TOXICITY	A	MICROBIOLOGICAL ASSOCIATES/N01-CP-41004
P-N,N-DIMETHYLAMINOPHENETHANOL	50438-75-0	MUTAGENESIS/GENETIC TOXICITY	A	MICROBIOLOGICAL ASSOCIATES/N01-CP-15739
N,N-DIMETHYL-P-TOLUIDINE	99-97-8	MUTAGENESIS/GENETIC TOXICITY	A	MICROBIOLOGICAL ASSOCIATES/N01-CP-15739
1,3-DIPHENYLGUANIDINE	102-06-7	MUTAGENESIS/GENETIC TOXICITY	C	MICROBIOLOGICAL ASSOCIATES/N01-CP-41004
N-DODECYLMERCAPTAN	112-55-0	MUTAGENESIS/GENETIC TOXICITY	C	MICROBIOLOGICAL ASSOCIATES/N01-CP-41004
ELLAGIC ACID DIHYDRATE	476-66-4	MUTAGENESIS/GENETIC TOXICITY	C	MICROBIOLOGICAL ASSOCIATES/N01-CP-41004
FERROCENE	102-54-5	MUTAGENESIS/GENETIC TOXICITY	A	MICROBIOLOGICAL ASSOCIATES/N01-CP-15739
GLUTATHIONE, OXIDIZED	27025-41-8	MUTAGENESIS/GENETIC TOXICITY	C	MICROBIOLOGICAL ASSOCIATES/N01-CP-41004
GLUTATHIONE, REDUCED	70-18-8	MUTAGENESIS/GENETIC TOXICITY	C	MICROBIOLOGICAL ASSOCIATES/N01-CP-41004

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TOXICOLOGY TESTING

NATIONAL CANCER INSTITUTE
DIVISION OF CANCER CAUSE AND PREVENTION
IN VITRO TESTING

CHEMICAL	CAS NO.	TEST TYPE	STATUS	PERFORMING ORGANIZATION/PROJECT NO.
HEPTADECYLHYDROXY-ETHYLIMIDAZOLINE	95-19-2	MUTAGENESIS/GENETIC TOXICITY	C	MICROBIOLOGICAL ASSOCIATES/N01-CP-41004
ISOAMYL NITRITE	110-46-3	MUTAGENESIS/GENETIC TOXICITY	A	MICROBIOLOGICAL ASSOCIATES/N01-CP-15739
ISOBUTYL NITRITE	542-56-3	MUTAGENESIS/GENETIC TOXICITY	A	MICROBIOLOGICAL ASSOCIATES/N01-CP-15739
ISOEUGENOL	97-54-1	MUTAGENESIS/GENETIC TOXICITY	C	MICROBIOLOGICAL ASSOCIATES/N01-CP-41004
2-ISOPROPOXYPHENYL N-METHYLCARBAMATE	114-26-1	MUTAGENESIS/GENETIC TOXICITY	C	MICROBIOLOGICAL ASSOCIATES/N01-CP-41004
LEAD NAPHTHENATE	61790-14-5	MUTAGENESIS/GENETIC TOXICITY	A	MICROBIOLOGICAL ASSOCIATES/N01-CP-15739
MANGANESE NAPHTHENATE	1336-93-2	MUTAGENESIS/GENETIC TOXICITY	B	MICROBIOLOGICAL ASSOCIATES/N01-CP-41004
METHYL FLUOROSULFONATE	421-20-5	MUTAGENESIS/GENETIC TOXICITY	A	MICROBIOLOGICAL ASSOCIATES/N01-CP-15739
NORDIHYDRO-GUAIARETIC ACID	500-38-9	MUTAGENESIS/GENETIC TOXICITY	C	MICROBIOLOGICAL ASSOCIATES/N01-CP-41004
OCTAMETHYLCYCLOTETRASILOXANE	556-67-2	MUTAGENESIS/GENETIC TOXICITY	A	MICROBIOLOGICAL ASSOCIATES/N01-CP-15739
OCTAMETHYLTRISILOXANE	107-51-7	MUTAGENESIS/GENETIC TOXICITY	A	MICROBIOLOGICAL ASSOCIATES/N01-CP-15739
N-PROPYL NITRITE	543-67-9	MUTAGENESIS/GENETIC TOXICITY	A	MICROBIOLOGICAL ASSOCIATES/N01-CP-15739
PYRAZINE	290-37-9	MUTAGENESIS/GENETIC TOXICITY	A	MICROBIOLOGICAL ASSOCIATES/N01-CP-15739
QUESTRAN		MUTAGENESIS/GENETIC TOXICITY	A	MICROBIOLOGICAL ASSOCIATES/N01-CP-15739
SAFFRON	11012-59-2	MUTAGENESIS/GENETIC TOXICITY	C	MICROBIOLOGICAL ASSOCIATES/N01-CP-41004
SULFAMETHIZOLE	144-82-1	MUTAGENESIS/GENETIC TOXICITY	C	MICROBIOLOGICAL ASSOCIATES/N01-CP-41004
SULFANILAMIDE	63-74-1	MUTAGENESIS/GENETIC TOXICITY	C	MICROBIOLOGICAL ASSOCIATES/N01-CP-41004
SULFATHIAZOLE	72-14-0	MUTAGENESIS/GENETIC TOXICITY	C	MICROBIOLOGICAL ASSOCIATES/N01-CP-41004
ALPHA-TERPINEOL	98-55-5	MUTAGENESIS/GENETIC TOXICITY	C	MICROBIOLOGICAL ASSOCIATES/N01-CP-41004
1,2,4,5-TETRACHLOROBENZENE	95-94-3	MUTAGENESIS/GENETIC TOXICITY	A	MICROBIOLOGICAL ASSOCIATES/N01-CP-41004
TRIGONELLINE	535-83-1	MUTAGENESIS/GENETIC TOXICITY	C	MICROBIOLOGICAL ASSOCIATES/N01-CP-41004
TRIPHENYL ANTIMONY	603-36-1	MUTAGENESIS/GENETIC TOXICITY	A	MICROBIOLOGICAL ASSOCIATES/N01-CP-15739
ZINC NAPHTHENATE	12001-85-3	MUTAGENESIS/GENETIC TOXICITY	A	MICROBIOLOGICAL ASSOCIATES/N01-CP-15739

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NATIONAL CANCER INSTITUTE
DIVISION OF CANCER CAUSE AND PREVENTION
BACTERIAL MUTAGENESIS

CHEMICAL	CAS NO.	TEST TYPE	STATUS	PERFORMING ORGANIZATION/PROJECT NO.
ABIETIC ACID	514-10-3	MUTAGENESIS/GENETIC TOXICITY	A	RESEARCH TRIANGLE INSTITUTE/NO1-CP-15740
ACETALDEHYDE	75-07-0	MUTAGENESIS/GENETIC TOXICITY	C	MICROBIOLOGICAL ASSOCIATES/NO1-CP-41030
5-AZACYTIDINE	320-67-2	MUTAGENESIS/GENETIC TOXICITY	A	RESEARCH TRIANGLE INSTITUTE/NO1-CP-15740
N-BUTYL NITRITE	544-16-1	MUTAGENESIS/GENETIC TOXICITY	A	RESEARCH TRIANGLE INSTITUTE/NO1-CP-15740
CARMINIC ACID	1260-17-9	MUTAGENESIS/GENETIC TOXICITY	C	MICROBIOLOGICAL ASSOCIATES/NO1-CP-41030
P-CHLORO-ALPHA,ALPHA,ALPHA-TRIFLUORO TOLUENE	98-56-6	MUTAGENESIS/GENETIC TOXICITY	C	MICROBIOLOGICAL ASSOCIATES/NO1-CP-41030
CHOLESTYRAMINE	11041-12-6	MUTAGENESIS/GENETIC TOXICITY	C	MICROBIOLOGICAL ASSOCIATES/NO1-CP-41030
C.I. ACID YELLOW 151	12715-61-6	MUTAGENESIS/GENETIC TOXICITY	A	RESEARCH TRIANGLE INSTITUTE/NO1-CP-15740
C.I. ACID BASIC RED 18	14097-03-1	MUTAGENESIS/GENETIC TOXICITY	A	RESEARCH TRIANGLE INSTITUTE/NO1-CP-15740
C.I. DIRECT RED 80	2610-10-8	MUTAGENESIS/GENETIC TOXICITY	A	RESEARCH TRIANGLE INSTITUTE/NO1-CP-15740
C.I. DIRECT YELLOW 4	91-34-9	MUTAGENESIS/GENETIC TOXICITY	A	RESEARCH TRIANGLE INSTITUTE/NO1-CP-15740
C.I. DISPERSE BROWN 1	23355-64-8	MUTAGENESIS/GENETIC TOXICITY	A	RESEARCH TRIANGLE INSTITUTE/NO1-CP-15740
L-CYSTEINE	52-90-4	MUTAGENESIS/GENETIC TOXICITY	A	RESEARCH TRIANGLE INSTITUTE/NO1-CP-15740
1,3-DIPHENYLGUANIDINE	102-06-7	MUTAGENESIS/GENETIC TOXICITY	C	MICROBIOLOGICAL ASSOCIATES/NO1-CP-41030
N-DODECYLMERCAPTAN	112-55-0	MUTAGENESIS/GENETIC TOXICITY	C	MICROBIOLOGICAL ASSOCIATES/NO1-CP-41030
ELLAGIC ACID DIHYDRATE	476-66-4	MUTAGENESIS/GENETIC TOXICITY	A	RESEARCH TRIANGLE INSTITUTE/NO1-CP-15740
GLUTATHIONE, OXIDIZED	27025-41-8	MUTAGENESIS/GENETIC TOXICITY	A	RESEARCH TRIANGLE INSTITUTE/NO1-CP-15740
GLUTATHIONE, REDUCED	70-18-8	MUTAGENESIS/GENETIC TOXICITY	A	RESEARCH TRIANGLE INSTITUTE/NO1-CP-15740
HEPTADECYLHYDROXY-ETHYLIMIDAZOLINE	95-19-2	MUTAGENESIS/GENETIC TOXICITY	A	RESEARCH TRIANGLE INSTITUTE/NO1-CP-15740
ISOEUGENOL	97-54-1	MUTAGENESIS/GENETIC TOXICITY	C	MICROBIOLOGICAL ASSOCIATES/NO1-CP-41030
2-ISOPROPOXYPHENYL N-METHYLCARBAMATE	114-26-1	MUTAGENESIS/GENETIC TOXICITY	C	MICROBIOLOGICAL ASSOCIATES/NO1-CP-41030
LAPACHOL	84-79-7	MUTAGENESIS/GENETIC TOXICITY	C	MICROBIOLOGICAL ASSOCIATES/NO1-CP-41030
NORDIHYDRO-GUAIDARETIC ACID	500-38-9	MUTAGENESIS/GENETIC TOXICITY	C	MICROBIOLOGICAL ASSOCIATES/NO1-CP-41030
QUESTRAN		MUTAGENESIS/GENETIC TOXICITY	C	MICROBIOLOGICAL ASSOCIATES/NO1-CP-41030
SAFFRON	11012-59-2	MUTAGENESIS/GENETIC TOXICITY	C	MICROBIOLOGICAL ASSOCIATES/NO1-CP-41030
SULFAMETHIZOLE	144-82-1	MUTAGENESIS/GENETIC TOXICITY	C	MICROBIOLOGICAL ASSOCIATES/NO1-CP-41030
SULFANILAMIDE	63-74-1	MUTAGENESIS/GENETIC TOXICITY	C	MICROBIOLOGICAL ASSOCIATES/NO1-CP-41030
SULFATHIAZOLE	72-14-0	MUTAGENESIS/GENETIC TOXICITY	C	MICROBIOLOGICAL ASSOCIATES/NO1-CP-41030
ALPHA-TERPINEOL	98-55-5	MUTAGENESIS/GENETIC TOXICITY	A	RESEARCH TRIANGLE INSTITUTE/NO1-CP-15740
1,2,4,5-TETRACHLOROBENZENE	95-94-3	MUTAGENESIS/GENETIC TOXICITY	C	MICROBIOLOGICAL ASSOCIATES/NO1-CP-41030

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TOXICOLOGY TESTING

NATIONAL CANCER INSTITUTE
DIVISION OF CANCER CAUSE AND PREVENTION
STRUCTURE ACTIVITY, SYRIAN HAMSTERS

CHEMICAL	CAS NO.	TEST TYPE	STATUS	PERFORMING ORGANIZATION/PROJECT NO.
ACROLEIN DIETHYLACETAL	3054-95-3	CARCINOGENESIS	A	FCRC/NO1-CP-75380
ACROLEIN OXIME	5314-33-0	CARCINOGENESIS	A	FCRC/NO1-CP-75380
ALLYL ALCOHOL	107-18-6	CARCINOGENESIS	A	FCRC/NO1-CP-75380
AZOXYETHANE		CARCINOGENESIS	B	NCI-FCRF
AZOXYMETHANE		CARCINOGENESIS	A	NCI-FCRF
2,6-DIMETHYLDINITROSOPIPERAZINE	55380-34-2	CARCINOGENESIS	A	FCRC/NO1-CP-75380
2,6-DIMETHYLNITROSOMORPHOLINE	1456-28-6	CARCINOGENESIS	A	FCRC/NO1-CP-75380
METHAPYRILENE HYDROCHLORIDE	135-23-9	CARCINOGENESIS	A	FCRC/NO1-CP-75380
NITROSOALLYLHYDROXYPROPYLAMINE		CARCINOGENESIS	A	FCRC/NO1-CP-75380
NITROSOALLYLOXOPROPYLAMINE		CARCINOGENESIS	A	FCRC/NO1-CP-75380
NITROSOAZETIDINE	15216-10-1	CARCINOGENESIS	A	FCRC/NO1-CP-75380
NITROSOBIS-(2-HYDROXYPROPYLAMINE)		CARCINOGENESIS	A	FCRC/NO1-CP-75380
NITROSO-BIS-(2-OXOPROPYL)-AMINE	60599-38-4	CARCINOGENESIS	A	FCRC/NO1-CP-75380
NITROSODIETHANOLAMINE		CARCINOGENESIS	B	NCI-FCRF
NITROSODIETHYLAMINE		CARCINOGENESIS	B	NCI-FCRF
NITROSODIMETHYLAMINE	62-75-9	CARCINOGENESIS	A	NCI-FCRF
NITROSODIHYDROXYPROPYLALLYLAMINE		CARCINOGENESIS	A	FCRC/NO1-CP-75380
NITROSODIHYDROXYPROPYLETHANOLAMINE		CARCINOGENESIS	A	FCRC/NO1-CP-75380
NITROSODIHYDROXYPROPYLOXOPROPYLAMINE		CARCINOGENESIS	A	FCRC/NO1-CP-75380
1-NITROSO-1-ETHYL-3-(2-HYDROXY)-UREA		CARCINOGENESIS	A	NCI-FCRF
NITROSOETHYLUREA		CARCINOGENESIS	B	NCI-FCRF
N-NITROSO-N-ETHYLURETHANE	614-95-9	CARCINOGENESIS	A	NCI-FCRF
1-NITROSO-1-(2-HYDROXYETHYL)-3--ETHYLUREA		CARCINOGENESIS	A	NCI-FCRF
NITROSOHYDROXYETHYLUREA	13743-07-2	CARCINOGENESIS	B	FCRC/NO1-CP-75380
NITROSOHYDROXYPROPYLOXOPROPYLAMINE		CARCINOGENESIS	A	FCRC/NO1-CP-75380
NITROSO-2-HYDROXYPROPYLUREA	71752-69-7	CARCINOGENESIS	A	FCRC/NO1-CP-75380
NITROSOISOPROPANOLETHANOLAMINE		CARCINOGENESIS	A	FCRC/NO1-CP-75380
NITROSO-N-METHYLANILINE	614-00-6	CARCINOGENESIS	A	NCI-FCRF
NITROSOMETHYLDIETHYLUREA	51285-72-8	CARCINOGENESIS	A	FCRC/NO1-CP-75380

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TOXICOLOGY TESTING

NATIONAL CANCER INSTITUTE
DIVISION OF CANCER CAUSE AND PREVENTION
STRUCTURE ACTIVITY, SYRIAN HAMSTERS

CHEMICAL	CAS NO.	TEST TYPE	STATUS	PERFORMING ORGANIZATION/PROJECT NO.
NITROSOMETHYLDIHYDROXYPROPYLAMINE		CARCINOGENESIS	A	FCRC/N01-CP-75380
NITROSOMETHYLETHYLAMINE		CARCINOGENESIS	B	NCI-FCRF
NITROSOMETHYL-N-HEXYLAMINE	28538-70-7	CARCINOGENESIS	A	FCRC/N01-CP-75380
NITROSOMETHYL-2-HYDROXYPROPYLAMINE		CARCINOGENESIS	A	FCRC/N01-CP-75380
NITROSO-2-METHYLMORPHOLINE	75881-16-2	CARCINOGENESIS	A	FCRC/N01-CP-75380
NITROSO-5-METHYLOXAZOLIDINE	35631-27-7	CARCINOGENESIS	A	FCRC/N01-CP-75380
NITROSO-5-METHYLOXAZOLIDONE	35631-27-7	CARCINOGENESIS	A	FCRC/N01-CP-75380
NITROSOMETHYL-2-OXOPROPYLAMINE		CARCINOGENESIS	A	FCRC/N01-CP-75380
NITROSOMORPHOLINE	59-89-2	CARCINOGENESIS	A	NCI-FCRF
NITROSOMORPHOLINE-3,3,5,5-D4		CARCINOGENESIS	A	NCI-FCRF
NITROSOOXAZOLIDINE	39884-52-1	CARCINOGENESIS	A	FCRC/N01-CP-75380
NITROSOOXAZOLIDONE	38347-74-9	CARCINOGENESIS	A	FCRC/N01-CP-75380
NITROSOOXOPROPYLETHANOLAMINE		CARCINOGENESIS	A	FCRC/N01-CP-75380
NITROSOTRIETHYLUREA		CARCINOGENESIS	A	FCRC/N01-CP-75380
NITROSOTRIHYDROXYDIPROPYLAMINE		CARCINOGENESIS	A	FCRC/N01-CP-75380
NITROSOTRIMETHYLPIPERAZINE	75881-18-4	CARCINOGENESIS	A	FCRC/N01-CP-75380

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TOXICOLOGY TESTING

NATIONAL CANCER INSTITUTE
DIVISION OF CANCER TREATMENT
TEST ON POTENTIAL CANCER CHEMOTHERAPEUTIC AGENTS

CHEMICAL	CAS NO.	TEST TYPE	STATUS	PERFORMING ORGANIZATION/PROJECT NO.
ANTHRA[1,9-CD]PYRAZOL-6(2H)-ONE,5-[3-AMINO-PROPYL)AMINO]-7,10-DIHYDROXY-2-[2-[2-HYDROXY-ETHYL)AMINO]-ETHYL]-,HYDROCHLORIDE		ACUTE/CHRONIC TOXICITY	C	DCT CONTRACTOR
ANTHRA[1,9-CD]PYRAZOL-6(2H)-ONE, 7,10-DIHYDROXY-2[2-[2-HYDROXYETHYL)AMINO]-ETHYL]-5-[[2-(METHYL-AMINO)ETHYL]AMINO]		ACUTE/CHRONIC TOXICITY	C	WARNER LAMBERT
ARA AC	65886-71-7	ACUTE/CHRONIC TOXICITY	C	DCT CONTRACTOR
BENZENE SULFONAMIDE, 4-AMINO-N-(5(or 8)-CHLORO-2-QUINOXALINYL)-		ACUTE/CHRONIC TOXICITY	C	DCT CONTRACTOR
4H-1-BENZOPYRAN-8-ACETIC ACID, 4-OXO-2-PHENYL		ACUTE/CHRONIC TOXICITY	A	DCT CONTRACTOR
L-CYSTEINE, ETHYL ESTER, METHYL CARBAMATE (ESTER), MONO-HYDROCHLORIDE	51785-99-0	ACUTE/CHRONIC TOXICITY	C	DCT CONTRACTOR
DEOXYSPERGUALIN		ACUTE/CHRONIC TOXICITY	A	DCT CONTRACTOR
DIHYDROTRIAZINE	31368-48-6	ACUTE/CHRONIC TOXICITY	A	DCT CONTRACTOR
1,5,2,4-DIOXADITHIEPANE, 2,2,4,4-TETRAOXIDE		ACUTE/CHRONIC TOXICITY	C	DCT CONTRACTOR
GLYCENE ESTER OF APHIDICOLIN		ACUTE/CHRONIC TOXICITY	C	DCT CONTRACTOR
PANCRATIASTATIN		ACUTE/CHRONIC TOXICITY	C	DCT CONTRACTOR
PHYLLANTHROSIDE	63166-73-4	ACUTE/CHRONIC TOXICITY	C	DCT CONTRACTOR
2H-PYRAN-2-ONE, 5,6-DIHYDRO-6-(3,6,13-TRIHYDOXY-3-METHYL-4-(PHOSPHONOOXY)-1,7,9,-TRIDECATETRAENYL)-, MONOSODIUM SALT		ACUTE/CHRONIC TOXICITY	A	WARNER LAMBERT
TETROCARCIN A, SODIUM SALT		ACUTE/CHRONIC TOXICITY	C	DCT CONTRACTOR

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TOXICOLOGY TESTING

NATIONAL INSTITUTE OF ENVIRONMENTAL HEALTH SCIENCES
EXTRAMURAL PROGRAM

CHEMICAL	CAS NO.	TEST TYPE	STATUS	PERFORMING ORGANIZATION/PROJECT NO.
ACRYLONITRILE	107-13-1	CARCINOGENESIS	B	NEW YORK UNIV./R01 ES 3043-03
AIRBORNE PARTICULATES		PULMONARY TOXICITY	B	HARVARD UNIVERSITY/R01-ES-3186
AROMATIC HYDROCARBONS		MUTAGENESIS/GENETIC TOXICITY	B	UNIV. OF LEIDEN/5 R01 ES 1027-10
AROMATIC HYDROCARBONS		MUTAGENESIS/GENETIC TOXICITY	B	UNIV. OF NORTH CAROLINA/R01-ES-3433
AZA-AROMATIC HYDROCARBONS		MUTAGENESIS/GENETIC TOXICITY	B	SRI INTERNATIONAL/R01 ES 3249-02
CHEMICAL PROMUTAGENS		MUTAGENESIS/GENETIC TOXICITY	B	HOPE COLL./1 R01 ES 2384-05
5-CHLOROPYRIMIDINES		MUTAGENESIS/GENETIC TOXICITY	B	OAK RIDGE NAT'L LAB/R01 ES 2716-03
HALO ALKYL PHOSPHATES		MUTAGENESIS/GENETIC TOXICITY	B	UNIVERSITY OF WASHINGTON, SEATTLE R01 ES 2728-03
HEAVY METALS		MUTAGENESIS/GENETIC TOXICITY	B	UNIV. OF CONNECTICUT, STORRS R01 ES 2972-03
HEAVY METALS		MUTAGENESIS/GENETIC TOXICITY	B	MONTANA STATE UNIV./R01 ES 2995-03
HEAVY METALS		MUTAGENESIS/GENETIC TOXICITY	B	LIVERMORE NATIONAL LAB./R01 ES 2848-03
LIPID EPOXIDES		MUTAGENESIS/GENETIC TOXICITY	B	UNIV. OF SOUTHERN CALIFORNIA/R01-ES-3466
NITROARENES		MUTAGENESIS/GENETIC TOXICITY	B	CASE WESTERN RESERVE UNIVERSITY R01 ES 2844-03
NITROPYRENES		MUTAGENESIS/GENETIC TOXICITY	B	CASE WESTERN RESERVE UNIVERSITY R01 ES 2827-03
OXIDIZED LIPIDS		MUTAGENESIS/GENETIC TOXICITY	B	UNIV. OF TEXAS, GALVESTON/R01-ES-2394
QUINOLINES		CARCINOGENESIS	B	AMER. HEALTH FOUNDATION/R01 ES 2338-04
QUINOLINES		MUTAGENESIS/GENETIC TOXICITY	B	STATE UNIV. OF NEW YORK AT BUFFALO/ R01-ES-3218
VINYL CHLORIDE	75-01-4	CARCINOGENESIS	B	NEW YORK UNIV./R01 ES 1150-10

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TOXICOLOGY TESTING

NATIONAL INSTITUTE OF ENVIRONMENTAL HEALTH SCIENCES
INTRAMURAL PROGRAM

CHEMICAL	CAS NO.	TEST TYPE	STATUS	PERFORMING ORGANIZATION/PROJECT NO.
*BENZO(F)QUINOLINE	85-02-9	PHARMACOKINETICS/METABOLISM	A	SYSTEMIC TOXICOLOGY BRANCH/Z01-ES-21036
*O-BENZYL-P-CHLOROPHENOL	120-32-1	PHARMACOKINETICS/METABOLISM	C	SYSTEMIC TOXICOLOGY BRANCH/Z01-ES-21069
*1,2-DIBROMO-3-CHLOROPROPANE	96-12-8	ACUTE/CHRONIC TOXICITY PHARMACOKINETICS/METABOLISM SYSTEMIC/ORGAN TOXICITY	B	CARCINOGENESIS AND TOXICOL. EVAL. BRANCH Z01-ES-30100
DICHLORODIPHENYLETHYLENE	72-55-9	CLINICAL TOXICOLOGY/EPIDEMIOLOGY REPRODUCTIVE/DEVELOPMENTAL TOXICITY	B	EPIDEMIOLOGY BRANCH/Z01-ES-43002
*ETHYLNITROSOUREA	759-73-9	MUTAGENESIS/GENETIC TOXICITY	A	CELLULAR AND GENETIC TOXICOLOGY BRANCH Z01-ES-60102
*HALOGENATED DIBENZOFURANS		PHARMACOKINETICS/METABOLISM	A	SYSTEMIC TOXICOLOGY BRANCH/Z01-ES-21003
*HEXABROMONAPHTHALENE		PHARMACOKINETICS/METABOLISM	A	SYSTEMIC TOXICOLOGY BRANCH/Z01-ES-21026
*KEPONE	143-50-0	BIOCHEMICAL/CELLULAR/TISSUE EFFECTS REPRODUCTIVE/DEVELOPMENTAL TOXICITY	A	SYSTEMIC TOXICOLOGY BRANCH/Z01-ES-21029
METALS, TRACE		CLINICAL TOXICOLOGY/EPIDEMIOLOGY CARCINOGENESIS	B	EPIDEMIOLOGY BRANCH/Z01-ES-43004
*METHYL CARBAMATE	598-55-0	PHARMACOKINETICS/METABOLISM	A	SYSTEMIC TOXICOLOGY BRANCH/Z01-ES-21072
*METHYLDOPA	555-30-6	REPRODUCTIVE/DEVELOPMENTAL TOXICITY	B	CARCINOGENESIS AND TOXICOL. EVAL. BRANCH Z01-ES-21077
*OCHRATOXIN A	37203-43-3	IMMUNOLOGIC TOXICITY	A	CHEMICAL PATHOLOGY BRANCH/Z01-ES-21047
*OLIVE OIL/RAPE SEED OIL		ACUTE/CHRONIC TOXICITY	A	CHEMICAL PATHOLOGY BRANCH/Z01-ES-21066
PCB'S		CLINICAL TOXICOLOGY/EPIDEMIOLOGY REPRODUCTIVE/DEVELOPMENTAL TOXICITY	B	EPIDEMIOLOGY BRANCH/Z01-ES-43002
*PYRENE	129-00-0	MUTAGENESIS/GENETIC TOXICITY	A	CELLULAR AND GENETIC TOXICOLOGY BRANCH
*SODIUM AZIDE	26628-22-8	MUTAGENESIS/GENETIC TOXICITY	A	CELLULAR AND GENETIC TOXICOLOGY BRANCH Z01-ES-60102
*SODIUM BISULFITE	7631-90-5	MUTAGENESIS/GENETIC TOXICITY	A	CELLULAR AND GENETIC TOXICOLOGY BRANCH
DIBENZO-P-DIOXIN		REPRODUCTIVE/DEVELOPMENTAL TOXICITY	B	SYSTEMIC TOXICOLOGY BRANCH/Z01-ES-21070
*4,4'-THIOBIS(6-TERT-BUTYL)M-CRESOL	90-66-4	PHARMACOKINETICS/METABOLISM	A	SYSTEMIC TOXICOLOGY BRANCH/Z01-ES-21025
TRIALKYL LEAD AND TIN COMPOUNDS		NEUROLOGIC/BEHAVIORAL TOXICITY	B	LAB. BEHAV. & NEUROL. TOXICOL. Z01-ES-90036

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TOXICOLOGY TESTING

NATIONAL INSTITUTE OF ENVIRONMENTAL HEALTH SCIENCES
CONTRACTS

CHEMICAL	CAS NO.	TEST TYPE	STATUS	PERFORMING ORGANIZATION/PROJECT NO.
*AZODICARBONAMIDE	123-77-3	PHARMACOKINETICS/METABOLISM	A	LOVELACE INHALATION TOXICITY RESEARCH INST./22Y01-ES-20092
*BENZENE	71-43-2	PHARMACOKINETICS/METABOLISM	C	LOVELACE INHALATION TOXICITY RESEARCH INST./22Y01-ES-20092
*1,3-BUTADIENE	106-99-0	PHARMACOKINETICS/METABOLISM	C	LOVELACE INHALATION TOXICITY RESEARCH INST./22Y01-ES-20092
*TERT-BUTYLPERBENZOATE	614-45-9	PHARMACOKINETICS/METABOLISM	A	RESEARCH TRIANGLE INST./N01-ES-1-5007
*CROTONALDEHYDE	4170-30-3	PHARMACOKINETICS/METABOLISM	A	RESEARCH TRIANGLE INST./N01-ES-1-5007
*DECABROMOBIPHENYL OXIDE	1163-19-5	PHARMACOKINETICS/METABOLISM	B	SOUTHERN RESEARCH INST./N01-ES-1-5008
*1,3-DICHLORO-5,5'-DIMETHYL-HYDANTOIN	118-52-5	PHARMACOKINETICS/METABOLISM	A	RESEARCH TRIANGLE INST./N01-ES-1-5007
*HEXACHLORO-1,3-BUTADIENE		PHARMACOKINETICS/METABOLISM	A	RESEARCH TRIANGLE INST./N01-ES-1-5007
*METHYL BROMIDE	74-83-9	PHARMACOKINETICS/METABOLISM	A	LOVELACE INHALATION TOXICITY RESEARCH INST./22Y01-ES-20092
*POLYBROMINATED BIPHENYLS		CLINICAL TOXICOLOGY/EPIDEMIOLOGY IMMUNOLOGIC TOXICITY	A	MT. SINAI SCH. OF MED./N01-ES-9-0004
POLYCHLORINATED BIPHENYLS		CLINICAL TOXICOLOGY/EPIDEMIOLOGY REPRODUCTIVE/DEVELOPMENTAL TOXICITY	B	EAST CAROLINA UNIV.,/N01-ES-0-0005
POLYCHLORINATED BIPHENYLS		CLINICAL TOXICOLOGY/EPIDEMIOLOGY REPRODUCTIVE/DEVELOPMENTAL TOXICITY	B	DURHAM WOMEN'S CLINIC/N01-ES-1-5006
POLYCHLORINATED BIPHENYLS		CLINICAL TOXICOLOGY/EPIDEMIOLOGY REPRODUCTIVE/DEVELOPMENTAL TOXICITY	B	WAKE AREA HEALTH EDUCATION CENTER N01-ES-0-0006

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158<

TOXICOLOGY TESTING

NATIONAL INSTITUTE OF ENVIRONMENTAL HEALTH SCIENCES
CONTRACTS
IN VITRO MICROBIAL*

CHEMICAL	CAS NO.	TEST TYPE	STATUS	PERFORMING ORGANIZATION/PROJECT NO.
2-ACETYLAMINO-4-METHYLPHENOL	6375-17-3	MUTAGENESIS/GENETIC TOXICITY	A	
N-ACETYL-M-AMINOPHENOL	621-42-1	MUTAGENESIS/GENETIC TOXICITY	A	ALL IN VITRO MICROBIAL TESTS ARE TO BE PERFORMED AT ONE OR BOTH OF THE FOLLOWING ORGANIZATIONS: MICROBIOLOGICAL ASSOC./N01-ES-35021 SRI INTERNATIONAL/N01-ES-35022
ACETYLSALICYLIC ACID	50-78-2	MUTAGENESIS/GENETIC TOXICITY	C	
N-ACETYL-M-TOLUIDINE	537-92-8	MUTAGENESIS/GENETIC TOXICITY	A	
N-ACETYL-P-TOLUIDINE	103-89-9	MUTAGENESIS/GENETIC TOXICITY	A	
ADIPONITRILE	111-69-3	MUTAGENESIS/GENETIC TOXICITY	A	
AGARITINE	2757-90-6	MUTAGENESIS/GENETIC TOXICITY	A	
ALDICARB	116-06-3	MUTAGENESIS/GENETIC TOXICITY	C	
ALLOXAN	50-71-5	MUTAGENESIS/GENETIC TOXICITY	A	
ALLOXAN MONOHYDRATE	3237-50-1	MUTAGENESIS/GENETIC TOXICITY	C	
ALLYL THIOUREA	109-57-9	MUTAGENESIS/GENETIC TOXICITY	A	
AMILORIDE HCL	2016-88-8	MUTAGENESIS/GENETIC TOXICITY	A	
2-AMINOACETANILIDE	555-48-6	MUTAGENESIS/GENETIC TOXICITY	A	
5-(4-AMINOBENZAMIDO)-2,3-CRESOTIC ACID	6265-15-2	MUTAGENESIS/GENETIC TOXICITY	A	
2-AMINOBENZENESULFONIC ACID	88-21-1	MUTAGENESIS/GENETIC TOXICITY	A	
3-AMINOBENZENESULFONIC ACID	121-47-1	MUTAGENESIS/GENETIC TOXICITY	A	
4-AMINOBENZENESULFONIC ACID	121-57-3	MUTAGENESIS/GENETIC TOXICITY	A	
2-AMINOBENZIMIDAZOLE	934-32-7	MUTAGENESIS/GENETIC TOXICITY	A	
2-AMINO-4-CHLORO-6-NITROPHENOL	6358-08-3	MUTAGENESIS/GENETIC TOXICITY	A	
2-AMINO-6-CHLORO-4-NITROPHENOL	6358-09-4	MUTAGENESIS/GENETIC TOXICITY	A	
2-AMINO-4-CHLOROPHENOL	95-85-2	MUTAGENESIS/GENETIC TOXICITY	A	
6-AMINO-4-CHLORO-1-PHENOL-2-SULFONIC ACID	88-23-3	MUTAGENESIS/GENETIC TOXICITY	A	
2-AMINO-4,6-DICHLOROPHENOL	527-62-8	MUTAGENESIS/GENETIC TOXICITY	A	
2-AMINO-4,6-DINITROPHENOL	96-91-3	MUTAGENESIS/GENETIC TOXICITY	A	
4-AMINO-4'-HYDROXY-3-METHYLDIPHENYLAMINE	6219-89-2	MUTAGENESIS/GENETIC TOXICITY	A	
1-AMINO-2-METHYLANTHRAQUINONE	82-28-0	MUTAGENESIS/GENETIC TOXICITY	A	
2-AMINO-4-METHYLPHENOL	95-84-1	MUTAGENESIS/GENETIC TOXICITY	A	
3-AMINO-4-METHYLPHENOL	2836-00-2	MUTAGENESIS/GENETIC TOXICITY	A	
3-AMINO-6-METHYLPHENOL	2835-95-2	MUTAGENESIS/GENETIC TOXICITY	A	
2-AMINO-4-(METHYLSULFONYL)PHENOL	98-30-6	MUTAGENESIS/GENETIC TOXICITY	A	
2-AMINO-3-NITRO-4-METHYLPHENOL	6265-05-0	MUTAGENESIS/GENETIC TOXICITY	A	
2-AMINO-5-NITRO-4-METHYLPHENOL	6265-06-1	MUTAGENESIS/GENETIC TOXICITY	A	
2-AMINO-6-NITRO-1-PHENOL-4-SUL-				

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TOXICOLOGY TESTING

NATIONAL INSTITUTE OF ENVIRONMENTAL HEALTH SCIENCES
CONTRACTS
IN VITRO MICROBIAL*

CHEMICAL	CAS NO.	TEST TYPE	STATUS	PERFORMING ORGANIZATION/PROJECT NO.
FONIC ACID	96-93-5	MUTAGENESIS/GENETIC TOXICITY	A	
6-AMINO-4-NITRO-1-PHENOL-2-SULFONIC ACID	96-67-3	MUTAGENESIS/GENETIC TOXICITY	A	
2-AMINO-1-PHENOL-4-SULFONIC ACID	98-37-3	MUTAGENESIS/GENETIC TOXICITY	A	
3-AMINO-5-SULFOSALICYLIC ACID	6201-86-1	MUTAGENESIS/GENETIC TOXICITY	A	
5-AMINO-3-SULFOSALICYLIC ACID	6201-87-2	MUTAGENESIS/GENETIC TOXICITY	A	
3-AMINOTRIAZOLE	61-82-5	MUTAGENESIS/GENETIC TOXICITY	A	
2-AMINO-3,4,6-TRICHLOROPHENOL	6358-15-2	MUTAGENESIS/GENETIC TOXICITY	A	
AMPHOTERICIN B	1397-89-3	MUTAGENESIS/GENETIC TOXICITY	A	
ANILAZINE	101-05-3	MUTAGENESIS/GENETIC TOXICITY	C	
ANTHRAQUINONE	84-65-1	MUTAGENESIS/GENETIC TOXICITY	C	
AROCLOR 1254	11097-69-1	MUTAGENESIS/GENETIC TOXICITY	C	
ATRAZIN	1912-24-9	MUTAGENESIS/GENETIC TOXICITY	A	
5-AZACYTIDINE	320-67-2	MUTAGENESIS/GENETIC TOXICITY	C	
AZATHIOPRINE	446-86-6	MUTAGENESIS/GENETIC TOXICITY	A	
AZOXYMETHANE	25843-45-2	MUTAGENESIS/GENETIC TOXICITY	A	
BARIUM CHLORIDE DIHYDRATE	10326-27-9	MUTAGENESIS/GENETIC TOXICITY	A	
BENOMYL	17804-35-2	MUTAGENESIS/GENETIC TOXICITY	A	
BENZENE SULFONIC ACID	98-11-3	MUTAGENESIS/GENETIC TOXICITY	A	
BENZIMIDAZOLE	51-17-2	MUTAGENESIS/GENETIC TOXICITY	A	
BENZIMIDAZOL-2-YLUREA	24370-25-0	MUTAGENESIS/GENETIC TOXICITY	A	
BENZOIC ACID	65-85-0	MUTAGENESIS/GENETIC TOXICITY	A	
BENZO(E)PYRENE	192-97-2	MUTAGENESIS/GENETIC TOXICITY	A	
BENZOTRIAZOLE	27556-51-0	MUTAGENESIS/GENETIC TOXICITY	A	
BENZOYL CHLORIDE	98-88-4	MUTAGENESIS/GENETIC TOXICITY	A	
BERYLLIUM SULFATE TETRAHYDRATE	7787-56-6	MUTAGENESIS/GENETIC TOXICITY	A	
BIS T-BUTYLDIOXYISOPROPYLBENZENE	25155-25-3	MUTAGENESIS/GENETIC TOXICITY	A	
1,3-BIS(TERT-BUTYLDIOXYISOPROPYL)BENZENE	2212-81-9	MUTAGENESIS/GENETIC TOXICITY	A	
BIS(1,5-CYCLOOCTADIENE) NICKEL	1295-35-8	MUTAGENESIS/GENETIC TOXICITY	A	
BIS(CYCLOPENTADIENYL)VANADIUM CHLORIDE	12083-48-6	MUTAGENESIS/GENETIC TOXICITY	A	
BIS(2-ETHYLHEXYL)ISOPHTHALATE	137-89-3	MUTAGENESIS/GENETIC TOXICITY	A	
(4,4'-BITHIAZOLE)-2,2'-DIAMINE	58139-59-6	MUTAGENESIS/GENETIC TOXICITY	C	
BIUREA	110-21-4	MUTAGENESIS/GENETIC TOXICITY	A	
BROMOCHLOROACETALDEHYDE		MUTAGENESIS/GENETIC TOXICITY	A	
BROMOCHLOROACETONITRILE		MUTAGENESIS/GENETIC TOXICITY	A	
BROMOPICRIN	464-10-8	MUTAGENESIS/GENETIC TOXICITY	A	
1-BROMO-2-PROPANOL	19686-73-8	MUTAGENESIS/GENETIC TOXICITY	A	
1,3-BUTADIENE	106-99-0	MUTAGENESIS/GENETIC TOXICITY	C	
2-(2-BUTOXYETHOXY)ETHYLTHIOCYANATE	112-56-1	MUTAGENESIS/GENETIC TOXICITY	A	

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TOXICOLOGY TESTING

NATIONAL INSTITUTE OF ENVIRONMENTAL HEALTH SCIENCES
CONTRACTS
IN VITRO MICROBIAL*

CHEMICAL	CAS NO.	TEST TYPE	STATUS	PERFORMING ORGANIZATION/PROJECT NO.
TERT-BUTYL CHROMATE	1189-85-1	MUTAGENESIS/GENETIC TOXICITY	A	
N-BUTYL GLYCIDYL ETHER	2426-08-6	MUTAGENESIS/GENETIC TOXICITY	A	
T-BUTYL GLYCIDYL ETHER	7665-72-7	MUTAGENESIS/GENETIC TOXICITY	A	
T-BUTYL PHENYL GLYCIDYL ETHER	3101-60-8	MUTAGENESIS/GENETIC TOXICITY	A	
BUTYRIC ACID	107-92-6	MUTAGENESIS/GENETIC TOXICITY	A	
CARBARSONE	121-59-5	MUTAGENESIS/GENETIC TOXICITY	A	
4-(3-CARBAZOL-3-YL-AMINO)PHENOL	86-72-6	MUTAGENESIS/GENETIC TOXICITY	A	
CARBON TETRACHLORIDE	56-23-5	MUTAGENESIS/GENETIC TOXICITY	C	
CARMINIC ACID	1260-17-9	MUTAGENESIS/GENETIC TOXICITY	A	
4-(CHLOROACETYL)ACETANILIDE	140-49-8	MUTAGENESIS/GENETIC TOXICITY	C	
N-(3-CHLOROALLYL)HEXAMINIUM CHLORIDE	4080-31-3	MUTAGENESIS/GENETIC TOXICITY	A	
4-CHLORO-2-(2,4-DINITROANILINO-)PHENOL	6358-18-5	MUTAGENESIS/GENETIC TOXICITY	A	
CHLORONEB	2675-77-6	MUTAGENESIS/GENETIC TOXICITY	A	
1-CHLORO-1-NITROPROPANE	600-25-9	MUTAGENESIS/GENETIC TOXICITY	A	
2-CHLORO-2-NITROPROPANE	594-71-8	MUTAGENESIS/GENETIC TOXICITY	A	
2-CHLORO-1,3-PROPANEDIOL	497-04-1	MUTAGENESIS/GENETIC TOXICITY	A	
1-CHLORO-2-PROPANOL	127-00-4	MUTAGENESIS/GENETIC TOXICITY	C	
2-CHLORO-1-PROPANOL	78-89-7	MUTAGENESIS/GENETIC TOXICITY	A	
3-CHLORO-1-PROPANOL	627-30-5	MUTAGENESIS/GENETIC TOXICITY	A	
O-CHLOROSTYRENE	2039-87-4	MUTAGENESIS/GENETIC TOXICITY	A	
CHLOROTHIAZIDE	58-94-6	MUTAGENESIS/GENETIC TOXICITY	A	
CHLOROTHIOFORMIC ACID	EMTDP-49	MUTAGENESIS/GENETIC TOXICITY	C	
CHROMIUM CARBONYL	13007-92-6	MUTAGENESIS/GENETIC TOXICITY	C	
C.I. DIRECT BLACK 114	61703-05-7	MUTAGENESIS/GENETIC TOXICITY	A	
C.I. DIRECT ORANGE 6	6637-88-3	MUTAGENESIS/GENETIC TOXICITY	A	
C.I. DISPERSE BLUE 27	15791-78-3	MUTAGENESIS/GENETIC TOXICITY	C	
C.I. PIGMENT ORANGE 7	5850-81-7	MUTAGENESIS/GENETIC TOXICITY	A	
C.I. PIGMENT RED 2	6041-94-7	MUTAGENESIS/GENETIC TOXICITY	A	
C.I. PIGMENT RED 8	6410-30-6	MUTAGENESIS/GENETIC TOXICITY	A	
C.I. PIGMENT RED 69	5850-90-8	MUTAGENESIS/GENETIC TOXICITY	A	
CINNAMALDEHYDE ETHYLENE GLYCOL ACETAL	5660-60-6	MUTAGENESIS/GENETIC TOXICITY	A	
CLONITRALID	1420-04-8	MUTAGENESIS/GENETIC TOXICITY	A	
COBALTOCENE	1277-43-6	MUTAGENESIS/GENETIC TOXICITY	A	
COUMAPHOS	56-72-4	MUTAGENESIS/GENETIC TOXICITY	A	
M-CRESIDINE	102-50-1	MUTAGENESIS/GENETIC TOXICITY	C	

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NATIONAL INSTITUTE OF ENVIRONMENTAL HEALTH SCIENCES
CONTRACTS
IN VITRO MICROBIAL*

CHEMICAL	CAS NO.	TEST TYPE	STATUS	PERFORMING ORGANIZATION/PROJECT NO.
P-CRESIDINE	120-71-8	MUTAGENESIS/GENETIC TOXICITY	A	
O-CRESYL GLYCIDYL ETHER	2210-79-9	MUTAGENESIS/GENETIC TOXICITY	A	
4-CUMYLPHENYLDIPHENYL PHOSPHATE (CPDPP MIXED ISOMERS)	50851-28-0	MUTAGENESIS/GENETIC TOXICITY	A	
P-CUMYL PHENYL GLYCIDYL ETHER	61578-04-9	MUTAGENESIS/GENETIC TOXICITY	A	
1,2-CYCLOHEXANEDICARBOXYLIC ACID, BIS(OXIRANYLMETHYL) ESTER	5493-45-8	MUTAGENESIS/GENETIC TOXICITY	A	
CYCLOHEXIMIDE	66-81-9	MUTAGENESIS/GENETIC TOXICITY	A	
CYCLOSPORIN A	59865-13-3	MUTAGENESIS/GENETIC TOXICITY	A	
CYTARABINE	147-94-4	MUTAGENESIS/GENETIC TOXICITY	A	
CYTEMBENA	21739-91-3	MUTAGENESIS/GENETIC TOXICITY	A	
D AND C YELLOW NO. 11	8003-22-3	MUTAGENESIS/GENETIC TOXICITY	C	
DECANOIC ACID	334-48-5	MUTAGENESIS/GENETIC TOXICITY	A	
DEHYDROEMETINE HYDROCHLORIDE	4914-30-1	MUTAGENESIS/GENETIC TOXICITY	A	
2,4-DIAMINOANISOLE SULFATE	39156-41-7	MUTAGENESIS/GENETIC TOXICITY	A	
3,4-DIAMINOTOLUENE	496-72-0	MUTAGENESIS/GENETIC TOXICITY	C	
DIBROMOACETALDEHYDE	3039-13-2	MUTAGENESIS/GENETIC TOXICITY	A	
DI-SEC-BUTANOLAMINE	21838-75-5	MUTAGENESIS/GENETIC TOXICITY	A	
DIBUTYL PHENYL PHOSPHATE	2528-36-1	MUTAGENESIS/GENETIC TOXICITY	A	
DICHLORAN	99-30-9	MUTAGENESIS/GENETIC TOXICITY	A	
DICHLOROACETALDEHYDE	79-02-7	MUTAGENESIS/GENETIC TOXICITY	A	
5,6-DICHLORO-2-BENZOTHIAZOLAMINE	24072-75-1	MUTAGENESIS/GENETIC TOXICITY	C	
CIS-1,2-DICHLOROETHYLENE	156-59-2	MUTAGENESIS/GENETIC TOXICITY	C	
4,5-DICHLORO-6-METHYL-2-METHYL--SULFONYLPYRIMIDINE	17901-16-5	MUTAGENESIS/GENETIC TOXICITY	A	
1,3-DICHLORO-2-PROPANOL	96-23-1	MUTAGENESIS/GENETIC TOXICITY	A	
2,3-DICHLOROPROPYLENE	78-88-6	MUTAGENESIS/GENETIC TOXICITY	A	
DICHLORVOS	62-73-7	MUTAGENESIS/GENETIC TOXICITY	A	
5-DIETHYLAMINO-2-NITROSO-4-METHYLPHENOL	6265-09-4	MUTAGENESIS/GENETIC TOXICITY	A	
5-DIETHYLAMINO-2-NITROSOPHENYL HCL	25953-06-4	MUTAGENESIS/GENETIC TOXICITY	A	
3-DIETHYLAMINOPHENOL	91-68-9	MUTAGENESIS/GENETIC TOXICITY	A	
N,N'-DIETHYLCARBANILIDE	85-98-3	MUTAGENESIS/GENETIC TOXICITY	C	
DIETHYLDICHLOROSILANE	1719-53-5	MUTAGENESIS/GENETIC TOXICITY	A	
DIETHYLENE GLYCOL BIS-GLYCIDYL ETHER	4206-61-5	MUTAGENESIS/GENETIC TOXICITY	A	
2,2'-DIETHYLHEXYLAMINE	106-20-7	MUTAGENESIS/GENETIC TOXICITY	A	
N,N-DIETHYL-4-((5-NITRO-2-THIAZOLYL)AZO) BENZENAMINE	54289-46-2	MUTAGENESIS/GENETIC TOXICITY	C	
N,N-DIETHYL-P-PHENYLENEDIAMINE	93-05-0	MUTAGENESIS/GENETIC TOXICITY	C	
DIGITONIN	11024-24-1	MUTAGENESIS/GENETIC TOXICITY	A	

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161<

TOXICOLOGY TESTING

NATIONAL INSTITUTE OF ENVIRONMENTAL HEALTH SCIENCES
CONTRACTS
IN VITRO MICROBIAL*

CHEMICAL	CAS NO.	TEST TYPE	STATUS	PERFORMING ORGANIZATION/PROJECT NO.
3,3'-DIHYDROXYBENZIDINE	2373-98-0	MUTAGENESIS/GENETIC TOXICITY	A	
DIHYDROXYUREA	686-68-0	MUTAGENESIS/GENETIC TOXICITY	A	
DI(ISOPROPYLPHENYL)PHENYL PHOSPHATE (DIPP)	28109-00-4	MUTAGENESIS/GENETIC TOXICITY	A	
2,3-DIMETHOXYANILINE HYDROCHLORIDE	54150-69-5	MUTAGENESIS/GENETIC TOXICITY	C	
4,4'-DIMETHOXYDIPHENYLAMINE	101-70-2	MUTAGENESIS/GENETIC TOXICITY	C	
4-DIMETHYLAMINOAZOBENZENE	60-11-7	MUTAGENESIS/GENETIC TOXICITY	A	
3-DIMETHYLAMINO-4-METHYLPHENOL	119-31-3	MUTAGENESIS/GENETIC TOXICITY	A	
5-DIMETHYLAMINO-2-NITROSO-4-METHYLPHENOL	6265-11-8	MUTAGENESIS/GENETIC TOXICITY	A	
3,3'-DIMETHYLBENZIDINE DIHYDROCHLORIDE	612-82-8	MUTAGENESIS/GENETIC TOXICITY	A	
TRANS-1,3-DIMETHYLCYCLOPENTANE	1759-58-6	MUTAGENESIS/GENETIC TOXICITY	A	
1,1-DIMETHYL-1-(2-HYDROXYPROPYLAMINE)TETRADECANIMIDE	38848-76-9	MUTAGENESIS/GENETIC TOXICITY	A	
1,2-DIMETHYL-3-NITROBENZENE	83-41-0	MUTAGENESIS/GENETIC TOXICITY	A	
1,2-DIMETHYL-4-NITROBENZENE	99-51-4	MUTAGENESIS/GENETIC TOXICITY	A	
1,3-DIMETHYL-2-NITROBENZENE	81-20-9	MUTAGENESIS/GENETIC TOXICITY	A	
1,3-DIMETHYL-4-NITROBENZENE	89-87-2	MUTAGENESIS/GENETIC TOXICITY	A	
1,3-DIMETHYL-5-NITROBENZENE	99-12-7	MUTAGENESIS/GENETIC TOXICITY	A	
1,4-DIMETHYL-2-NITROBENZENE	89-58-7	MUTAGENESIS/GENETIC TOXICITY	A	
N,N-DIMETHYL-P-PHENYLENEDIAMINE	93-98-9	MUTAGENESIS/GENETIC TOXICITY	C	
DIMETHYL SULFOXIDE	67-68-5	MUTAGENESIS/GENETIC TOXICITY	A	
N,N'-DI-2-NAPTHYL-P-PHENYLENEDIAMINE	93-46-9	MUTAGENESIS/GENETIC TOXICITY	C	
2,4-DINITROANILINE	97-02-9	MUTAGENESIS/GENETIC TOXICITY	C	
2-(2,4-DINITROANILINO)PHENOL	6358-23-2	MUTAGENESIS/GENETIC TOXICITY	A	
2,5-DINITRO-9H-FLUORENE	15110-74-4	MUTAGENESIS/GENETIC TOXICITY	A	
2,7-DINITRO-9H-FLUOREN-9-ONE	31551-45-8	MUTAGENESIS/GENETIC TOXICITY	A	
2,4-DINITRO-6-(1-METHYLHEPTYL)-PHENOL	3687-22-7	MUTAGENESIS/GENETIC TOXICITY	A	
1,3-DINITRONAPHTHALENE	606-37-1	MUTAGENESIS/GENETIC TOXICITY	A	
1,8-DINITRONAPHTHALENE	602-38-0	MUTAGENESIS/GENETIC TOXICITY	A	
1,5-DINITRONAPHTHALENE	605-71-0	MUTAGENESIS/GENETIC TOXICITY	A	
2,4-DINITROPHENOL	51-28-5	MUTAGENESIS/GENETIC TOXICITY	A	
4,4'-DIOCTYLDIPHENYLAMINE	101-67-7	MUTAGENESIS/GENETIC TOXICITY	C	
N,N'-DIPHENYL-P-PHENYLENEDIAMINE	74-31-7	MUTAGENESIS/GENETIC TOXICITY	C	

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ASYM-DIPHENYLUREA	603-54-3	MUTAGENESIS/GENETIC TOXICITY	C	
N,N'-DI-SEC-BUTYL-P-PHENYLDIAMINE	101-96-2	MUTAGENESIS/GENETIC TOXICITY	C	
ECONAZOLE	27220-47-9	MUTAGENESIS/GENETIC TOXICITY	A	
EPINEPHRINE	51-43-4	MUTAGENESIS/GENETIC TOXICITY	A	
2,3-EPOXYBUTANE	3266-23-7	MUTAGENESIS/GENETIC TOXICITY	C	
1,2-EPOXY-3-BUTENE	930-22-3	MUTAGENESIS/GENETIC TOXICITY	A	
1,2-EPOXYDECANE	2404-44-6	MUTAGENESIS/GENETIC TOXICITY	A	
2,3-EPOXY-1,4-DICHLOROBUTANE	3583-47-9	MUTAGENESIS/GENETIC TOXICITY	A	
2,3-EPOXY-2,3-DIMETHYLBUTANE	5076-20-0	MUTAGENESIS/GENETIC TOXICITY	A	
1,2-EPOXYDODECANE	2855-19-8	MUTAGENESIS/GENETIC TOXICITY	A	
1,2-EPOXY-3-FLUOROPROPANE	503-09-3	MUTAGENESIS/GENETIC TOXICITY	C	
1,2-EPOXY-1,1,2,3,3,3-HEXAFLUOROPROPANE	428-59-1	MUTAGENESIS/GENETIC TOXICITY	A	
1,2-EPOXYOCTADECANE	7390-81-0	MUTAGENESIS/GENETIC TOXICITY	A	
9,10-EPOXYOCTADECANOIC ACID, 2-ETHYLHEXYL ESTER	141-38-8	MUTAGENESIS/GENETIC TOXICITY	A	
1,2-EPOXYTETRADECANE	3234-28-4	MUTAGENESIS/GENETIC TOXICITY	A	
ETHINYLESTRADIOL	57-63-6	MUTAGENESIS/GENETIC TOXICITY	A	
ETHIONAMIDE	536-33-4	MUTAGENESIS/GENETIC TOXICITY	C	
N-(3-ETHOXYPHENYL)ACETAMIDE	591-33-3	MUTAGENESIS/GENETIC TOXICITY	A	
ETHYL ACETATE	141-78-6	MUTAGENESIS/GENETIC TOXICITY	C	
ETHYL CHLORIDE	75-00-3	MUTAGENESIS/GENETIC TOXICITY	A	
S-(ETHYL)CHLOROTHIOFORMIC ACID	2941-64-2	MUTAGENESIS/GENETIC TOXICITY	C	
1-ETHYL-4-(DIETHYLDIAMINE)-PIPERAZINE	EMTDP-59	MUTAGENESIS/GENETIC TOXICITY	C	
N-ETHYL-N,N-DIPHENYLUREA	18168-01-9	MUTAGENESIS/GENETIC TOXICITY	C	
S-ETHYL DIPROPYLTHIOCARBAMATE	759-94-4	MUTAGENESIS/GENETIC TOXICITY	A	
ETHYLENE OXIDE	75-21-8	MUTAGENESIS/GENETIC TOXICITY	A	
N-ETHYLENE-TETRAETHYLPENTAMINE	ENTDP-57	MUTAGENESIS/GENETIC TOXICITY	C	
2-ETHYLHEXANAL	123-05-7	MUTAGENESIS/GENETIC TOXICITY	A	
2-ETHYL-2-HEXENAL	645-62-5	MUTAGENESIS/GENETIC TOXICITY	A	
2-ETHYLHEXENAL	26266-68-2	MUTAGENESIS/GENETIC TOXICITY	A	
2-ETHYLHEXYLAMINE	104-75-6	MUTAGENESIS/GENETIC TOXICITY	A	
2-ETHYLHEXYL GLYCIDYL ETHER	2461-15-6	MUTAGENESIS/GENETIC TOXICITY	A	
3-((ETHYLHEXYL)OXY)PROPIONITRILE	10213-75-9	MUTAGENESIS/GENETIC TOXICITY	A	
3-((ETHYLHEXYL)OXY)PROPYLAMINE	5397-31-9	MUTAGENESIS/GENETIC TOXICITY	A	
ETHYLHYDROXY HEXANOIC ACID	29671-57-6	MUTAGENESIS/GENETIC TOXICITY	C	
N-ETHYL-4-NITROANILINE	3665-80-3	MUTAGENESIS/GENETIC TOXICITY	C	
N-ETHYL-O-TOLUENESULFONAMIDE	1077-56-1	MUTAGENESIS/GENETIC TOXICITY	A	
FD AND C RED NO. 32	3118-97-6	MUTAGENESIS/GENETIC TOXICITY	A	
FD AND C YELLOW NO. 6	2783-94-0	MUTAGENESIS/GENETIC TOXICITY	A	
FENDILINE	13042-18-7	MUTAGENESIS/GENETIC TOXICITY	A	

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FERRIC AMMONIUM FERROCYANIDE	25869-00-5	MUTAGENESIS/GENETIC TOXICITY	C	
FORMANILIDE	103-70-8	MUTAGENESIS/GENETIC TOXICITY	C	
GLYCIDYL ACRYLATE	106-90-1	MUTAGENESIS/GENETIC TOXICITY	A	
GLYCIDYL METHACRYLATE	106-91-2	MUTAGENESIS/GENETIC TOXICITY	A	
GRISEOFULVIN	126-07-8	MUTAGENESIS/GENETIC TOXICITY	A	
1,2,3,4,6,7-HEXABROMONAPHTHALENE	75625-24-0	MUTAGENESIS/GENETIC TOXICITY	A	
1,2,3,6,7,8-HEXACHLORODIBENZO--P-DIOXIN	57653-85-7	MUTAGENESIS/GENETIC TOXICITY	A	
HEXACHLORONAPHTHALENE	1335-87-1	MUTAGENESIS/GENETIC TOXICITY	A	
1,1,1,3,3,3-HEXAFLUORO-2-PROPANOL	920-66-1	MUTAGENESIS/GENETIC TOXICITY	A	
1,3,6-HEXANETRICARBONITRILE	1772-25-4	MUTAGENESIS/GENETIC TOXICITY	A	
HEXYL GLYCIDYL ETHER	5926-90-9	MUTAGENESIS/GENETIC TOXICITY	A	
HYCANTHONE METHANESULFONATE	23255-93-8	MUTAGENESIS/GENETIC TOXICITY	A	
HYDROCYANIC ACID	74-90-8	MUTAGENESIS/GENETIC TOXICITY	A	
HYDROXYLAMINE, HYDROCHLORIDE	5470-11-1	MUTAGENESIS/GENETIC TOXICITY	A	
8-HYDROXYQUINOLINE SULFATE	134-31-6	MUTAGENESIS/GENETIC TOXICITY	A	
IODACETIC ACID	64-69-7	MUTAGENESIS/GENETIC TOXICITY	A	
IODOCHLOROHYDROXYQUINOLINE	130-26-7	MUTAGENESIS/GENETIC TOXICITY	A	
ISOBUTYL ALCOHOL	78-83-1	MUTAGENESIS/GENETIC TOXICITY	C	
ISODECYL METHACRYLATE	29964-84-9	MUTAGENESIS/GENETIC TOXICITY	C	
ISOPHTHALIC DIGLYCIDYL ESTER	67846-32-6	MUTAGENESIS/GENETIC TOXICITY	A	
P-ISOPROPOXYDIPHENYLAMINE	101-73-5	MUTAGENESIS/GENETIC TOXICITY	C	
N-ISOPROPYLANILINE	768-52-5	MUTAGENESIS/GENETIC TOXICITY	A	
LANTHANUM NITRATE HEXAHYDRATE	10277-43-7	MUTAGENESIS/GENETIC TOXICITY	A	
LAURIC ACID	143-07-7	MUTAGENESIS/GENETIC TOXICITY	A	
LAURYL GLYCIDYL ETHER	2461-18-9	MUTAGENESIS/GENETIC TOXICITY	A	
LEVCO VAT BLUE 1	6537-68-4	MUTAGENESIS/GENETIC TOXICITY	C	
LITHOCHOLIC ACID	434-13-9	MUTAGENESIS/GENETIC TOXICITY	A	
LUMINOL	521-31-3	MUTAGENESIS/GENETIC TOXICITY	C	
MALAOXON	1634-78-2	MUTAGENESIS/GENETIC TOXICITY	A	
DL-MENTHOL	15356-70-4	MUTAGENESIS/GENETIC TOXICITY	C	
2-MERCAPTO-4-METHYL-5-THIAZOLYL METHYL KETONE	7725-93-1	MUTAGENESIS/GENETIC TOXICITY	C	
4-(METHODYBENZILIDINE-4'-BUTYLANILINE (MBBA)	26227-73-6	MUTAGENESIS/GENETIC TOXICITY	A	
3-((METHOXYCARBONYL)AMINO)PHEN-				

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NATIONAL INSTITUTE OF ENVIRONMENTAL HEALTH SCIENCES
CONTRACTS
IN VITRO MICROBIAL*

CHEMICAL	CAS NO.	TEST TYPE	STATUS	PERFORMING ORGANIZATION/PROJECT NO.
YL N-(3-METHYLPHENYL) CARBAMATE	13684-63-4	MUTAGENESIS/GENETIC TOXICITY	A	
METHOXYETHYL MERCURY CHLORIDE	123-88-6	MUTAGENESIS/GENETIC TOXICITY	A	
METHOXYFLURANE	76-38-0	MUTAGENESIS/GENETIC TOXICITY	A	
3-METHYLAMINO-4-METHYLPHENOL	6265-13-0	MUTAGENESIS/GENETIC TOXICITY	A	
METHYL-2 BENZIMIDAZOLE CARBAMATE	METHYL-2B	MUTAGENESIS/GENETIC TOXICITY	A	
4-(6-METHYL-2-BENZOTHIAZOYL)-BENZENAMINE	92-36-4	MUTAGENESIS/GENETIC TOXICITY	C	
METHYL BROMIDE	74-83-9	MUTAGENESIS/GENETIC TOXICITY	A	
METHYL DEMETON	8022-00-2	MUTAGENESIS/GENETIC TOXICITY	A	
N'-METHYL-N,N-DIPHENYLUREA	13114-72-2	MUTAGENESIS/GENETIC TOXICITY	C	
METHYLENEBIS(4-CYCLOHEXYL ISOCYANATE)	5124-30-1	MUTAGENESIS/GENETIC TOXICITY	A	
2,2'-METHYLENE BIS(PHENYLENE-OXYMETHYLENE)BISOXIRANE	39817-09-9	MUTAGENESIS/GENETIC TOXICITY	A	
METHYLENE BIS(THIOCYANATE)	6317-18-6	MUTAGENESIS/GENETIC TOXICITY	A	
METHYLENEDIANILINE	101-77-9	MUTAGENESIS/GENETIC TOXICITY	A	
METHYLETHYL KETONE	78-93-3	MUTAGENESIS/GENETIC TOXICITY	C	
METHYLGLUTARONITRILE	4553-62-2	MUTAGENESIS/GENETIC TOXICITY	A	
METHYL GLYCIDYL ETHER	930-37-0	MUTAGENESIS/GENETIC TOXICITY	A	
METHYL MERCURIC CHLORIDE	115-09-3	MUTAGENESIS/GENETIC TOXICITY	A	
METHYL MERCURY HYDROXIDE	1184-57-2	MUTAGENESIS/GENETIC TOXICITY	A	
2-METHYL-3-NITROANILINE	603-83-8	MUTAGENESIS/GENETIC TOXICITY	A	
2-METHYL-4-NITROANILINE	99-52-5	MUTAGENESIS/GENETIC TOXICITY	A	
2-METHYL-6-NITROANILINE	570-24-1	MUTAGENESIS/GENETIC TOXICITY	A	
4-METHYL-2-NITROANILINE	89-62-3	MUTAGENESIS/GENETIC TOXICITY	A	
4-METHYL-3-NITROANILINE	119-32-4	MUTAGENESIS/GENETIC TOXICITY	A	
5-METHYL-2-NITROANILINE	578-46-1	MUTAGENESIS/GENETIC TOXICITY	A	
N-METHYL-4-NITROANILINE	100-15-2	MUTAGENESIS/GENETIC TOXICITY	C	
2-METHYL-3-NITRO-BENZOIC ACID	1975-50-4	MUTAGENESIS/GENETIC TOXICITY	A	
3-METHYL-2-NITRO-BENZOIC ACID	5437-38-7	MUTAGENESIS/GENETIC TOXICITY	A	
3-METHYL-4-NITRO-BENZOIC ACID	3113-71-1	MUTAGENESIS/GENETIC TOXICITY	A	
4-METHYL-3-NITRO-BENZOIC ACID	96-98-0	MUTAGENESIS/GENETIC TOXICITY	A	
5-METHYL-2-NITRO-BENZOIC ACID	3113-72-2	MUTAGENESIS/GENETIC TOXICITY	A	
2-METHYL-5-NITRO-BENZOIC ACID	1975-52-6	MUTAGENESIS/GENETIC TOXICITY	C	
2-METHYL-6-NITRO BENZOIC ACID	13506-76-8	MUTAGENESIS/GENETIC TOXICITY	C	
METHYLTIN-TRIS(ISOOCTYLMERCAPTOACETATE)	54849-38-6	MUTAGENESIS/GENETIC TOXICITY	A	
METHYL TRIFLUOROMETHANESULFONATE	333-27-7	MUTAGENESIS/GENETIC TOXICITY	A	
METRONIDAZOLE	443-48-1	MUTAGENESIS/GENETIC TOXICITY	A	
MEXACARBATE	315-18-4	MUTAGENESIS/GENETIC TOXICITY	A	
MICHLER'S KETONE	90-94-8	MUTAGENESIS/GENETIC TOXICITY	C	

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165<

TOXICOLOGY TESTING

NATIONAL INSTITUTE OF ENVIRONMENTAL HEALTH SCIENCES
CONTRACTS
IN VITRO MICROBIAL*

CHEMICAL	CAS NO.	TEST TYPE	STATUS	PERFORMING ORGANIZATION/PROJECT NO.
MOLYBDENUM TRIOXIDE	1313-27-5	MUTAGENESIS/GENETIC TOXICITY	A	
MONOSODIUM GLUTAMATE	142-47-2	MUTAGENESIS/GENETIC TOXICITY	A	
4-(2-NAPHTHYLAMINO)PHENOL	93-45-8	MUTAGENESIS/GENETIC TOXICITY	A	
ALPHA-NAPHTHYL ISOTHIOCYANATE	551-06-4	MUTAGENESIS/GENETIC TOXICITY	A	
2-NAPHTHYL LACTATE	93-43-6	MUTAGENESIS/GENETIC TOXICITY	A	
NEODECANOIC ACID, 2,3-EPOXYPROPYL ESTER	26761-45-5	MUTAGENESIS/GENETIC TOXICITY	A	
NEOPENTYL GLYCOL DIGLYCIDYL ETHER	17557-23-2	MUTAGENESIS/GENETIC TOXICITY	A	
NICKEL CARBONYL	13463-39-3	MUTAGENESIS/GENETIC TOXICITY	A	
NIFEDIPINE	21829-25-4	MUTAGENESIS/GENETIC TOXICITY	A	
9-NITROANTHRACENE	602-60-8	MUTAGENESIS/GENETIC TOXICITY	A	
4-NITRO-1,3-BENZENEDIAMINE	5131-58-8	MUTAGENESIS/GENETIC TOXICITY	A	
O-NITROBENZOIC ACID	552-16-9	MUTAGENESIS/GENETIC TOXICITY	A	
O-NITROBENZOYL CHLORIDE	610-14-0	MUTAGENESIS/GENETIC TOXICITY	A	
M-NITROBENZYL CHLORIDE	619-23-8	MUTAGENESIS/GENETIC TOXICITY	A	
2-NITRO-1-BUTANOL	609-31-4	MUTAGENESIS/GENETIC TOXICITY	A	
2-NITRODIPHENYLAMINE	119-75-5	MUTAGENESIS/GENETIC TOXICITY	C	
2-NITROETHANOL	625-48-9	MUTAGENESIS/GENETIC TOXICITY	A	
3-NITRO-9-FLUORENONE	42135-22-8	MUTAGENESIS/GENETIC TOXICITY	A	
1-NITRO-2-METHYLNAPHTHALENE	881-03-8	MUTAGENESIS/GENETIC TOXICITY	A	
O-NITROPHENETHYLALCOHOL, ACETATE	833-43-2	MUTAGENESIS/GENETIC TOXICITY	A	
P-NITROPHENETHYLALCOHOL, ACETATE	104-30-3	MUTAGENESIS/GENETIC TOXICITY	A	
1-(4-NITROPHENYL)-2-CHLOROPROPANE	34197-98-3	MUTAGENESIS/GENETIC TOXICITY	A	
2-NITRO-P-PHENYLENEDIAMINE	5307-14-2	MUTAGENESIS/GENETIC TOXICITY	C	
4-NITROPHTHALIC ANHYDRIDE	5466-84-2	MUTAGENESIS/GENETIC TOXICITY	C	
3-NITROPROPIONIC ACID	504-88-1	MUTAGENESIS/GENETIC TOXICITY	A	
1-NITROPYRENE	5522-43-0	MUTAGENESIS/GENETIC TOXICITY	C	
N-NITROSODIETHYLAMINE	55-18-5	MUTAGENESIS/GENETIC TOXICITY	A	
N-NITROSODIPHENYLAMINE	86-30-6	MUTAGENESIS/GENETIC TOXICITY	C	
N-NITROSO-N-ETHYLURETHANE	614-95-9	MUTAGENESIS/GENETIC TOXICITY	A	
4-NITROSOPHENOL	104-91-6	MUTAGENESIS/GENETIC TOXICITY	C	
BETA-NITROSTYRENE	102-96-5	MUTAGENESIS/GENETIC TOXICITY	A	
5-NITRO-O-TOLUIDINE	99-55-8	MUTAGENESIS/GENETIC TOXICITY	C	
NONAMETHYLENEIMINE	4396-27-4	MUTAGENESIS/GENETIC TOXICITY	A	

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167<

TOXICOLOGY TESTING

NATIONAL INSTITUTE OF ENVIRONMENTAL HEALTH SCIENCES
CONTRACTS
IN VITRO MICROBIAL*

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NONYLPHENYL DIPHENYL PHOSPHATE (NPDPP MIXED ISOMERS)	64532-97-4	MUTAGENESIS/GENETIC TOXICITY	A	
NOSCAPINE	128-62-1	MUTAGENESIS/GENETIC TOXICITY	A	
NTA(NITRILOTRIACETIC ACID)	139-13-9	MUTAGENESIS/GENETIC TOXICITY	A	
OCTACHLORONAPHTHALENE	2234-13-1	MUTAGENESIS/GENETIC TOXICITY	A	
OCTANOIC ACID	124-07-2	MUTAGENESIS/GENETIC TOXICITY	A	
2-OCTYL-3-ISOTHIAZOLONE	26530-20-1	MUTAGENESIS/GENETIC TOXICITY	C	
P-N-OCTYLOXYBENZOIC ACID	2493-84-7	MUTAGENESIS/GENETIC TOXICITY	C	
OLEIC ACID DIETHANOLAMINE	13961-86-9	MUTAGENESIS/GENETIC TOXICITY	A	
OLIVETOL	500-66-3	MUTAGENESIS/GENETIC TOXICITY	A	
PENTAETHYLPENTAMINE	EMTDP-56	MUTAGENESIS/GENETIC TOXICITY	C	
1-PENTANOL	71-41-0	MUTAGENESIS/GENETIC TOXICITY	C	
3-PENTENENITRILE	4635-87-4	MUTAGENESIS/GENETIC TOXICITY	A	
2-PENTENENITRILE	13284-42-9	MUTAGENESIS/GENETIC TOXICITY	C	
2-(P-PENTYLPHENYL)-5-(P-PENTYLOXYPHENYL) PYRIMIDINE	34913-07-0	MUTAGENESIS/GENETIC TOXICITY	C	
PERCHLOROMETHYL MERCAPTAN	594-42-3	MUTAGENESIS/GENETIC TOXICITY	A	
PHENANTHRENE	85-01-8	MUTAGENESIS/GENETIC TOXICITY	A	
M-PHENETIDINE	621-33-0	MUTAGENESIS/GENETIC TOXICITY	A	
P-PHENETIDINE	156-43-4	MUTAGENESIS/GENETIC TOXICITY	A	
O-PHENYLENEDIAMINE	95-54-5	MUTAGENESIS/GENETIC TOXICITY	C	
M-PHENYLENEDIAMINE	108-45-2	MUTAGENESIS/GENETIC TOXICITY	C	
P-PHENYLENEDIAMINE DIHYDROCHLORIDE	624-18-0	MUTAGENESIS/GENETIC TOXICITY	A	
PHENYL GLYCIDYL ETHER	122-60-1	MUTAGENESIS/GENETIC TOXICITY	C	
N-PHENYL-1-NAPHTHYLAMINE	90-30-2	MUTAGENESIS/GENETIC TOXICITY	C	
PHENYLPHOSPHINE	638-21-1	MUTAGENESIS/GENETIC TOXICITY	A	
PICRYL CHLORIDE	88-88-0	MUTAGENESIS/GENETIC TOXICITY	A	
POLYETHYLPOTASSIUM 2-BENZYL-4-CHLOROPHENATE	35471-49-9	MUTAGENESIS/GENETIC TOXICITY	A	
POLYTHIAZIDE	346-18-9	MUTAGENESIS/GENETIC TOXICITY	A	
POTASSIUM P-TERT AMYLPHENATE	53404-18-5	MUTAGENESIS/GENETIC TOXICITY	A	
POTASSIUM DICHROMATE	7778-50-9	MUTAGENESIS/GENETIC TOXICITY	A	
PROCARBAZINE HYDROCHLORIDE	366-70-1	MUTAGENESIS/GENETIC TOXICITY	A	
PROGESTERONE	57-83-0	MUTAGENESIS/GENETIC TOXICITY	A	
2-PROPANOL, 1-CHLORO-, PHOSPHATE (3:1)	13674-84-5	MUTAGENESIS/GENETIC TOXICITY	A	
S-(N-PROPYL)CHLOROTHIOFORMIC ACID	EMTDP-51	MUTAGENESIS/GENETIC TOXICITY	C	
PROPYLENE	115-07-1	MUTAGENESIS/GENETIC TOXICITY	A	
PROPYLENE CYANOHYDRIN	2567-01-3	MUTAGENESIS/GENETIC TOXICITY	A	
PYRENE	129-00-0	MUTAGENESIS/GENETIC TOXICITY	A	
QUINACRINE DIHYDROCHLORIDE	69-05-6	MUTAGENESIS/GENETIC TOXICITY	A	
QUINACRINE MUSTARD	4213-45-0	MUTAGENESIS/GENETIC TOXICITY	A	

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TOXICOLOGY TESTING

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CONTRACTS
IN VITRO MICROBIAL*

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QUINETHAZONE (AQUAMOX)	73-49-4	MUTAGENESIS/GENETIC TOXICITY	A	
RESCINNAMINE	24815-24-5	MUTAGENESIS/GENETIC TOXICITY	C	
SCOPOLAMINE HYDROBROMIDE	114-49-8	MUTAGENESIS/GENETIC TOXICITY	A	
SODIUM CHLORIDE	7647-14-5	MUTAGENESIS/GENETIC TOXICITY	C	
SODIUM CYANURATE	2624-17-1	MUTAGENESIS/GENETIC TOXICITY	A	
SODIUM IODOMETHANESULFONATE	126-31-8	MUTAGENESIS/GENETIC TOXICITY	A	
STEARATOCHROMIC CHLORIDE COMPLEX	15242-96-3	MUTAGENESIS/GENETIC TOXICITY	A	
STYRENE	100-42-5	MUTAGENESIS/GENETIC TOXICITY	A	
SULFISOXAZOLE	127-69-5	MUTAGENESIS/GENETIC TOXICITY	A	
1,2,4,5-TETRABROMO-3,6-DIMETHYL-BENZENE	23488-38-2	MUTAGENESIS/GENETIC TOXICITY	A	
TETRACHLORONAPHTHALENE	1335-88-2	MUTAGENESIS/GENETIC TOXICITY	A	
2,3,5,6-TETRACHLORO-4-NITRO-ANISOLE	2438-88-2	MUTAGENESIS/GENETIC TOXICITY	A	
2,3,4,6-TETRACHLOROPHENOL	58-90-2	MUTAGENESIS/GENETIC TOXICITY	C	
2,3,4,5-TETRACHLOROPHENOL	4901-51-3	MUTAGENESIS/GENETIC TOXICITY	C	
2,3,5,6-TETRACHLOROPHENOL	935-95-5	MUTAGENESIS/GENETIC TOXICITY	C	
TETRACHROMIC ACID, POTASSIUM ZINC SALT	12433-50-0	MUTAGENESIS/GENETIC TOXICITY	C	
TETRADECANOIC ACID	544-63-8	MUTAGENESIS/GENETIC TOXICITY	C	
TETRAFLUOROETHYLENE	116-14-3	MUTAGENESIS/GENETIC TOXICITY	A	
N,N,N',N',TETRAMETHYL-P-PHENYLENEDIAMINE	100-22-1	MUTAGENESIS/GENETIC TOXICITY	C	
1,3,6,8-TETRANITROPYRENE	28767-61-5	MUTAGENESIS/GENETIC TOXICITY	C	
THIABENDAZOLE	148-79-8	MUTAGENESIS/GENETIC TOXICITY	A	
THIAZOLE	288-47-1	MUTAGENESIS/GENETIC TOXICITY	A	
THIOACETAMIDE	62-55-5	MUTAGENESIS/GENETIC TOXICITY	A	
THIOPHANATE M	23564-05-8	MUTAGENESIS/GENETIC TOXICITY	A	
THIOUREA	62-56-6	MUTAGENESIS/GENETIC TOXICITY	A	
TITANIUM DIOXIDE	13463-67-7	MUTAGENESIS/GENETIC TOXICITY	C	
D-ALPHA-TOCOPHEROL SUCCINATE	4345-03-3	MUTAGENESIS/GENETIC TOXICITY	A	
TOLAZAMIDE	1156-19-0	MUTAGENESIS/GENETIC TOXICITY	A	
O-TOLUALDEHYDE	529-20-4	MUTAGENESIS/GENETIC TOXICITY	A	
2,6-TOLUENEDIAMINE DIHYDROCHLORIDE	15481-70-6	MUTAGENESIS/GENETIC TOXICITY	C	
2,5-TOLUENEDIAMINE SULFATE	6369-59-1	MUTAGENESIS/GENETIC TOXICITY	C	
M-TOLUIDINE	108-44-1	MUTAGENESIS/GENETIC TOXICITY	A	

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NATIONAL INSTITUTE OF ENVIRONMENTAL HEALTH SCIENCES
CONTRACTS
IN VITRO MICROBIAL*

CHEMICAL	CAS NO.	TEST TYPE	STATUS	PERFORMING ORGANIZATION/PROJECT NO.
M-TOLUIDINE HYDROCHLORIDE	638-03-9	MUTAGENESIS/GENETIC TOXICITY	A	
P-TOLUNIDTRILE	104-85-8	MUTAGENESIS/GENETIC TOXICITY	C	
TRIALLYL ISOCYANURATE	1025-15-6	MUTAGENESIS/GENETIC TOXICITY	C	
TRIBENZYL ISOCYANURATE	606-03-1	MUTAGENESIS/GENETIC TOXICITY	C	
TRIBROMOACETONITRILE		MUTAGENESIS/GENETIC TOXICITY	A	
2,4,6-TRIBROMOPHENYL CARBONATE	67990-32-3	MUTAGENESIS/GENETIC TOXICITY	A	
TRI-SEC-BUTANOLAMINE	2421-02-5	MUTAGENESIS/GENETIC TOXICITY	A	
TRICHLOROMELAMINE	7673-09-8	MUTAGENESIS/GENETIC TOXICITY	A	
2,3,4-TRICHLORONITROBENZENE	17700-09-3	MUTAGENESIS/GENETIC TOXICITY	A	
2,4,5-TRICHLORONITROBENZENE	89-69-0	MUTAGENESIS/GENETIC TOXICITY	A	
2,4,6-TRICHLORONITROBENZENE	18708-70-8	MUTAGENESIS/GENETIC TOXICITY	A	
3,4,6-TRICHLORO-2-NITROPHENOL	82-62-2	MUTAGENESIS/GENETIC TOXICITY	A	
2,3,4-TRICHLOROPHENYL	15950-66-0	MUTAGENESIS/GENETIC TOXICITY	C	
2,3,5-TRICHLOROPHENOL	933-78-8	MUTAGENESIS/GENETIC TOXICITY	C	
2,3,6-TRICHLOROPHENOL	933-75-5	MUTAGENESIS/GENETIC TOXICITY	C	
3,4,5-TRICHLOROPHENOL	609-19-8	MUTAGENESIS/GENETIC TOXICITY	C	
TRIETHYLENE GLYCOL DIGLYCIDYL ETHER	1954-28-5	MUTAGENESIS/GENETIC TOXICITY	A	
TRIFLUOROTHYMIDINE	70-00-8	MUTAGENESIS/GENETIC TOXICITY	A	
1,8,9-TRIHYDROXYANTHRACENE	480-22-8	MUTAGENESIS/GENETIC TOXICITY	A	
TRIMETHYL ISOCYANURATE	827-16-7	MUTAGENESIS/GENETIC TOXICITY	C	
2,4,6-TRINITROANILINE	489-98-5	MUTAGENESIS/GENETIC TOXICITY	A	
1,3,6-TRINITROPYRENE	75321-19-6	MUTAGENESIS/GENETIC TOXICITY	C	
2,4,6-TRINITROTOLUENE	118-96-7	MUTAGENESIS/GENETIC TOXICITY	A	
TRIPHENYLTIN HYDROXIDE	76-87-9	MUTAGENESIS/GENETIC TOXICITY	A	
TRI-N-PROPYLAMINE	102-69-2	MUTAGENESIS/GENETIC TOXICITY	A	
TRIS(CARBAMOYLMETHYL)ISOCYANURATE	1843-48-7	MUTAGENESIS/GENETIC TOXICITY	C	
TRIS(3-CHLORO-2-HYDROXYPROPYL)-ISOCYANURATE	7423-53-2	MUTAGENESIS/GENETIC TOXICITY	C	
TRIS(2,3-EPOXYPROPYL)-ISOCYANURATE	2451-62-9	MUTAGENESIS/GENETIC TOXICITY	C	
TRIS(2-ETHYLHEXYL)TRIMELLITATE	3319-31-1	MUTAGENESIS/GENETIC TOXICITY	A	
1,3,5-TRIS(2-HYDROXYETHYL)-TRIAZINE-2,4,6-TRIONE	839-90-7	MUTAGENESIS/GENETIC TOXICITY	C	
TRIS(2-KETOPROPYL)ISOCYANURATE	61050-97-3	MUTAGENESIS/GENETIC TOXICITY	C	
TRIS(TRIPHENYLSTANNYL)ISOCYANURATE	752-74-9	MUTAGENESIS/GENETIC TOXICITY	C	
P-TRITOLYL PHOSPHATE	78-32-0	MUTAGENESIS/GENETIC TOXICITY	A	
O-TRITOLYL PHOSPHATE	78-30-8	MUTAGENESIS/GENETIC TOXICITY	A	
URETHANE	51-79-6	MUTAGENESIS/GENETIC TOXICITY	A	
UROTROPINE	100-97-0	MUTAGENESIS/GENETIC TOXICITY	A	
VALERONITRILE	110-59-8	MUTAGENESIS/GENETIC TOXICITY	A	

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TOXICOLOGY TESTING

NATIONAL INSTITUTE OF ENVIRONMENTAL HEALTH SCIENCES
CONTRACTS
IN VITRO MICROBIAL*

CHEMICAL	CAS NO.	TEST TYPE	STATUS	PERFORMING ORGANIZATION/PROJECT NO.
VERAPAMIL	52-53-9	MUTAGENESIS/GENETIC TOXICITY	A	
1-VINYL-4-(DIETHYLDIAMINE)-PIPERAZINE	EMTOP-58	MUTAGENESIS/GENETIC TOXICITY	C	
VINYLIDENE FLUORIDE	75-38-7	MUTAGENESIS/GENETIC TOXICITY	A	
VITAMIN D	1406-16-2	MUTAGENESIS/GENETIC TOXICITY	A	
WATER	7732-18-5	MUTAGENESIS/GENETIC TOXICITY	C	
XYLENES, COMMERCIAL MIXTURE	1330-20-7	MUTAGENESIS/GENETIC TOXICITY	A	
ZIRCONOCENE DICHLORIDE	1291-32-3	MUTAGENESIS/GENETIC TOXICITY	A	

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NATIONAL INSTITUTE OF ENVIRONMENTAL HEALTH SCIENCES
CONTRACTS
IN VITRO CYTOGENETIC CHO CELLS*

CHEMICAL	CAS NO.	TEST TYPE	STATUS	PERFORMING ORGANIZATION/PROJECT NO.
ACETALDEHYDE	75-07-0	MUTAGENESIS/GENETIC TOXICITY	A	
ACETIN	26446-35-5	MUTAGENESIS/GENETIC TOXICITY	C	
ALLOXAN MONOHYDRATE	3237-50-1	MUTAGENESIS/GENETIC TOXICITY	C	
2-AMINCANTHRACENE	613-13-8	MUTAGENESIS/GENETIC TOXICITY	C	
3-AMINOTRIAZOLE	61-82-5	MUTAGENESIS/GENETIC TOXICITY	C	ALL IN VITRO CYTOGENETIC TESTS ARE TO BE PERFORMED AT ONE OR MORE OF THE FOLLOWING ORGANIZATIONS: BIOASSAY SYSTEMS CORP./N01-ES-3-5025 LITTON BIONETICS, INC./N01-ES-3-5030 ENV. HLTH. RES. TEST., INC./N01-ES-1-5789
AMPICILLIN TRIHYDRATE	7177-48-2	MUTAGENESIS/GENETIC TOXICITY	C	
5-AZACYTIDINE	320-67-2	MUTAGENESIS/GENETIC TOXICITY	C	
1-AZIRIDINEETHANOL	1072-52-2	MUTAGENESIS/GENETIC TOXICITY	C	
AZODICARBONAMIDE	123-77-3	MUTAGENESIS/GENETIC TOXICITY	A	
BENZO(A)PYRENE	50-32-8	MUTAGENESIS/GENETIC TOXICITY	A	
BENZYL CHLORIDE	100-44-7	MUTAGENESIS/GENETIC TOXICITY	A	
BISPHENOL A DIGLYCIDYL ETHER	1675-54-3	MUTAGENESIS/GENETIC TOXICITY	C	
BIUREA	110-21-4	MUTAGENESIS/GENETIC TOXICITY	A	
1,3-BUTADIENE	106-99-0	MUTAGENESIS/GENETIC TOXICITY	C	
2-BUTANONE PEROXIDE	1338-23-4	MUTAGENESIS/GENETIC TOXICITY	A	
TERT-BUTYL PERBENZOATE	614-45-9	MUTAGENESIS/GENETIC TOXICITY	A	
GAMMA-BUTYROLACTONE	96-48-0	MUTAGENESIS/GENETIC TOXICITY	C	
CALCIUM CHROMATE	13765-19-0	MUTAGENESIS/GENETIC TOXICITY	C	
CARBON DISULFIDE	75-15-0	MUTAGENESIS/GENETIC TOXICITY	A	
CARBROMAL	77-65-6	MUTAGENESIS/GENETIC TOXICITY	C	
CARISOPRODOL	78-44-4	MUTAGENESIS/GENETIC TOXICITY	A	
CHLORAL HYDRATE	302-17-0	MUTAGENESIS/GENETIC TOXICITY	C	
CHLORAMBEN	133-90-4	MUTAGENESIS/GENETIC TOXICITY	C	
CHLORAMBUCIL	305-03-3	MUTAGENESIS/GENETIC TOXICITY	C	
CHLORDANE	12789-03-6	MUTAGENESIS/GENETIC TOXICITY	A	
CHLORENDIC ACID	115-28-6	MUTAGENESIS/GENETIC TOXICITY	C	
CHLORINATED TRISODIUM PHOSPHATE	56802-99-4	MUTAGENESIS/GENETIC TOXICITY	C	
4-(CHLOROACETYL-ACETANILIDE	140-49-8	MUTAGENESIS/GENETIC TOXICITY	C	
CHLOROBENZENE	108-90-7	MUTAGENESIS/GENETIC TOXICITY	C	
2-CHLOROETHYLTRIMETHYLAMMONIUM CHLORIDE	999-81-5	MUTAGENESIS/GENETIC TOXICITY	C	
3-CHLORO-2-METHYLPROPENE	563-47-3	MUTAGENESIS/GENETIC TOXICITY	A	
CHLOROPRENE	126-99-8	MUTAGENESIS/GENETIC TOXICITY	C	
CHLORPHENIRAMINE MALEATE	113-92-8	MUTAGENESIS/GENETIC TOXICITY	C	
CHLORPROPAMIDE	94-20-2	MUTAGENESIS/GENETIC TOXICITY	C	
CHROMIUM CARBONYL	13007-92-6	MUTAGENESIS/GENETIC TOXICITY	C	
C.I. ACID RED 14	3567-69-9	MUTAGENESIS/GENETIC TOXICITY	C	
COUMAPHOS	56-72-4	MUTAGENESIS/GENETIC TOXICITY	C	
CYCLOPHOSPHAMIDE	50-18-0	MUTAGENESIS/GENETIC TOXICITY	A	
CYCLOSPORIN A	59865-13-3	MUTAGENESIS/GENETIC TOXICITY	A	
DECABROMODIPHENYL OXIDE	1163-19-5	MUTAGENESIS/GENETIC TOXICITY	C	
DIARYLANILIDE YELLOW	6358-85-6	MUTAGENESIS/GENETIC TOXICITY	C	
DIAZINON	333-41-5	MUTAGENESIS/GENETIC TOXICITY	C	

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NATIONAL INSTITUTE OF ENVIRONMENTAL HEALTH SCIENCES
CONTRACTS
IN VITRO CYTOGENETIC CHO CELLS*

CHEMICAL	CAS NO.	TEST TYPE	STATUS	PERFORMING ORGANIZATION/PROJECT NO.
1,2-DIBROMO-3-CHLOROPROPANE	96-12-8	MUTAGENESIS/GENETIC TOXICITY	C	
1,2-DIBROMO-4-(1,2-DIBROMOETHYL)CYCLOHEXANE	3322-93-8	MUTAGENESIS/GENETIC TOXICITY	C	
DIBROMOMANNITOL	488-41-5	MUTAGENESIS/GENETIC TOXICITY	C	
DIBUTYLTIN DIACETATE	1067-33-0	MUTAGENESIS/GENETIC TOXICITY	A	
DICHLOROACETONITRILE	3018-12-0	MUTAGENESIS/GENETIC TOXICITY	C	
3,4-DICHLORONITROBENZENE	99-54-7	MUTAGENESIS/GENETIC TOXICITY	C	
2,4-DICHLORONITROBENZENE	611-06-3	MUTAGENESIS/GENETIC TOXICITY	C	
2,3-DICHLORONITROBENZENE	3209-22-1	MUTAGENESIS/GENETIC TOXICITY	C	
1,3-DICHLOROPROPENE (TELONE II)	542-75-6	MUTAGENESIS/GENETIC TOXICITY	C	
DIELDRIN	60-57-1	MUTAGENESIS/GENETIC TOXICITY	A	
DIETHANOLAMINE	111-42-2	MUTAGENESIS/GENETIC TOXICITY	C	
1,8-DIHYDROXY-4,5-DINITROANTHRAQUINONE	81-55-0	MUTAGENESIS/GENETIC TOXICITY	D	
2,4-DIMETHOXYANILINE HYDROCHLORIDE	54150-69-5	MUTAGENESIS/GENETIC TOXICITY	C	
N,N-DIMETHYLANILINE	121-69-7	MUTAGENESIS/GENETIC TOXICITY	C	
DIMETHYLFORMAMIDE	68-12-2	MUTAGENESIS/GENETIC TOXICITY	C	
DIMETHYL TEREPHTHALATE	120-61-6	MUTAGENESIS/GENETIC TOXICITY	C	
2,4-DINITROANILINE	97-02-9	MUTAGENESIS/GENETIC TOXICITY	A	
2,7-DINITRO-9H-FLUOREN-9-ONE	31551-45-8	MUTAGENESIS/GENETIC TOXICITY	C	
2,4-DINITROTOLUENE	121-14-2	MUTAGENESIS/GENETIC TOXICITY	C	
DIPHENHYDRAMINE HYDROCHLORIDE	147-24-0	MUTAGENESIS/GENETIC TOXICITY	C	
ENDRIN	72-20-8	MUTAGENESIS/GENETIC TOXICITY	C	
EPHEDRINE SULFATE	134-72-5	MUTAGENESIS/GENETIC TOXICITY	A	
1,2-EPOXYHEXADECANE	7320-37-8	MUTAGENESIS/GENETIC TOXICITY	A	
1,2-EPOXY-3,3,3-TRICHLOROPROPANE	3083-23-6	MUTAGENESIS/GENETIC TOXICITY	C	
ERYTHROMYCIN STEARATE	643-22-1	MUTAGENESIS/GENETIC TOXICITY	C	
ETHYL BROMIDE	74-96-4	MUTAGENESIS/GENETIC TOXICITY	C	
ETHYLENEDIAMINE TETRAACETIC ACID (EDTA)	150-38-9	MUTAGENESIS/GENETIC TOXICITY	C	
ETHYLENE GLYCOL	107-21-1	MUTAGENESIS/GENETIC TOXICITY	C	
ETHYLENE OXIDE	75-21-8	MUTAGENESIS/GENETIC TOXICITY	A	
2-ETHYLHEXANOIC ACID	149-57-5	MUTAGENESIS/GENETIC TOXICITY	A	
2-ETHYLHEXANOL	104-76-7	MUTAGENESIS/GENETIC TOXICITY	A	
FERRIC AMMONIUM FERROCYANIDE	25869-00-5	MUTAGENESIS/GENETIC TOXICITY	C	
FURAN	110-00-9	MUTAGENESIS/GENETIC TOXICITY	A	

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TOXICOLOGY TESTING

NATIONAL INSTITUTE OF ENVIRONMENTAL HEALTH SCIENCES
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CHEMICAL	CAS NO.	TEST TYPE	STATUS	PERFORMING ORGANIZATION/PROJECT NO.
HC YELLOW 4	52551-67-4	MUTAGENESIS/GENETIC TOXICITY	C	
HEXACHLOROBENZENE	118-74-1	MUTAGENESIS/GENETIC TOXICITY	A	
HEXACHLOROCYCLOPENTADIENE	77-47-4	MUTAGENESIS/GENETIC TOXICITY	A	
ISOPRENE	78-79-5	MUTAGENESIS/GENETIC TOXICITY	C	
LASIOCARPINE	303-34-4	MUTAGENESIS/GENETIC TOXICITY	C	
D-LIMONENE	5989-27-5	MUTAGENESIS/GENETIC TOXICITY	C	
MALONALDEHYDE, SODIUM SALT	24382-04-5	MUTAGENESIS/GENETIC TOXICITY	C	
2-MERCAPTOBENZIMIDAZOLE	583-39-1	MUTAGENESIS/GENETIC TOXICITY	A	
ALPHA-METHYLBENZYL ALCOHOL	98-85-1	MUTAGENESIS/GENETIC TOXICITY	C	
METHYLDOPA	555-30-6	MUTAGENESIS/GENETIC TOXICITY	C	
NALIDIXIC ACID	389-08-2	MUTAGENESIS/GENETIC TOXICITY	C	
NTA(NITRILOTRIACETIC ACID)	139-13-9	MUTAGENESIS/GENETIC TOXICITY	C	
9-NITROANTHRACENE	602-60-8	MUTAGENESIS/GENETIC TOXICITY	C	
4-NITROANTHRANILIC ACID	619-17-0	MUTAGENESIS/GENETIC TOXICITY	A	
P-NITROBENZOYL CHLORIDE	122-04-3	MUTAGENESIS/GENETIC TOXICITY	A	
3-NITRO-9-FLUORENONE	42135-22-8	MUTAGENESIS/GENETIC TOXICITY	A	
NITROFURAZONE	59-87-0	MUTAGENESIS/GENETIC TOXICITY	A	
P-NITROPHENOL	100-02-7	MUTAGENESIS/GENETIC TOXICITY	C	
4-NITRO-O-PHENYLENEDIAMINE	99-56-9	MUTAGENESIS/GENETIC TOXICITY	A	
1-PHENYL-3-METHYL-5-PYRAZOLONE	89-25-8	MUTAGENESIS/GENETIC TOXICITY	C	
N-PHENYL-P-PHENYLENEDIAMINE	101-54-2	MUTAGENESIS/GENETIC TOXICITY	C	
1-PHENYL-2-THIOUREA	103-85-5	MUTAGENESIS/GENETIC TOXICITY	C	
PHOTODIELDRIN	13366-73-9	MUTAGENESIS/GENETIC TOXICITY	C	
PHTHALAMIDE	88-96-0	MUTAGENESIS/GENETIC TOXICITY	C	
PICRIC ACID	88-89-1	MUTAGENESIS/GENETIC TOXICITY	C	
PROPYLENE OXIDE	75-56-9	MUTAGENESIS/GENETIC TOXICITY	C	
1,3-PROPYLENE OXIDE	503-30-0	MUTAGENESIS/GENETIC TOXICITY	A	
RHODAMINE 6G	989-38-3	MUTAGENESIS/GENETIC TOXICITY	C	
ROTENONE	83-79-4	MUTAGENESIS/GENETIC TOXICITY	C	
SODIUM CHLORIDE	7647-14-5	MUTAGENESIS/GENETIC TOXICITY	C	
SODIUM DIETHYLDITHIOCARBAMATE	148-18-5	MUTAGENESIS/GENETIC TOXICITY	C	
SODIUM DODECYL SULFATE	151-21-3	MUTAGENESIS/GENETIC TOXICITY	C	
SUCCINIC ANHYDRIDE	108-30-5	MUTAGENESIS/GENETIC TOXICITY	C	
3-SULFOLENE	77-79-2	MUTAGENESIS/GENETIC TOXICITY	C	
2,3,5,6-TETRACHLORO-4-NITROANISOLE	2438-88-2	MUTAGENESIS/GENETIC TOXICITY	C	
TETRACYCLINE HYDROCHLORIDE	64-75-5	MUTAGENESIS/GENETIC TOXICITY	C	
TETRAKIS(HYDROXYMETHYL)PHOSPHONIUM CHLORIDE	124-64-1	MUTAGENESIS/GENETIC TOXICITY	C	
TITANIUM DIOXIDE	13463-67-7	MUTAGENESIS/GENETIC TOXICITY	C	
TOLBUTAMIDE	64-77-7	MUTAGENESIS/GENETIC TOXICITY	C	
TOLUENE (NITRATION GRADE)	108-88-3	MUTAGENESIS/GENETIC TOXICITY	C	
TOLUENE (TECHNICAL)	108-88-3	MUTAGENESIS/GENETIC TOXICITY	C	

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TOXICOLOGY TESTING

NATIONAL INSTITUTE OF ENVIRONMENTAL HEALTH SCIENCES
CONTRACTS
IN VITRO CYTOGENETIC CHO CELLS*

CHEMICAL	CAS NO.	TEST TYPE	STATUS	PERFORMING ORGANIZATION/PROJECT NO.
2,5-TOLUENEDIAMINE SULFATE	6369-59-1	MUTAGENESIS/GENETIC TOXICITY	C	
TRICHLORFON	52-68-6	MUTAGENESIS/GENETIC TOXICITY	C	
2,4,5-TRIMETHOXYBENZALDEHYDE	4460-86-0	MUTAGENESIS/GENETIC TOXICITY	C	
TRIMETHYLTHIOUREA	2489-77-2	MUTAGENESIS/GENETIC TOXICITY	A	
TRIPHENYLTIN HYDROXIDE	76-87-9	MUTAGENESIS/GENETIC TOXICITY	C	
4-VINYLCYCLOHEXENE	100-40-3	MUTAGENESIS/GENETIC TOXICITY	C	
VINYLIDENE CHLORIDE (1,1-DICHLOROETHYLENE)	75-35-4	MUTAGENESIS/GENETIC TOXICITY	C	
VINYLIDENE FLUORIDE	75-38-7	MUTAGENESIS/GENETIC TOXICITY	A	
VINYL TOLUENE	25013-15-4	MUTAGENESIS/GENETIC TOXICITY	A	

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TOXICOLOGY TESTING

NATIONAL INSTITUTE OF ENVIRONMENTAL HEALTH SCIENCES
CONTRACTS
DROSOPHILA*

CHEMICAL	CAS NO.	TEST TYPE	STATUS	PERFORMING ORGANIZATION/PROJECT NO.
ACRYLONITRILE	107-13-1	MUTAGENESIS/GENETIC TOXICITY	C	ALL DROSOPHILA TESTS ARE TO BE PERFORMED AT ONE OR BOTH OF THE FOLLOWING ORGANIZATIONS: BROWN UNIV/N01-ES-3-5027 UNIV. OF WISCONSIN/N01-ES-3-5028
AMPHETAMINE SULFATE	60-13-9	MUTAGENESIS/GENETIC TOXICITY	C	
BENZO(A)PYRENE	50-32-8	MUTAGENESIS/GENETIC TOXICITY	A	
BIS(2-CHLOROETHYL)ETHER	111-44-4	MUTAGENESIS/GENETIC TOXICITY	C	
1,3-BUTADIENE	106-99-0	MUTAGENESIS/GENETIC TOXICITY	C	
1,4-BUTANEDIOL DIGLYCIDYL ETHER	2425-79-8	MUTAGENESIS/GENETIC TOXICITY	C	
CHLORAMPHENICOL SODIUM SUCCINATE	982-57-0	MUTAGENESIS/GENETIC TOXICITY	C	
MONOCHLOROACETIC ACID	79-11-8	MUTAGENESIS/GENETIC TOXICITY	C	
1-CHLORO-2-PROPANOL	127-00-4	MUTAGENESIS/GENETIC TOXICITY	C	
C.I. BASIC ORANGE 2	532-82-1	MUTAGENESIS/GENETIC TOXICITY	C	
2,3-DIBROMO-2-BUTENE-1,4-DIOL	3234-02-4	MUTAGENESIS/GENETIC TOXICITY	C	
DICHLORAN	99-30-9	MUTAGENESIS/GENETIC TOXICITY	A	
1,8-DIHYDROXY-4,5-DINITROANTHRAQUINONE	81-55-0	MUTAGENESIS/GENETIC TOXICITY	A	
DIMETHYLETHANOLAMINE	108-01-0	MUTAGENESIS/GENETIC TOXICITY	C	
DIMETHYL METHYLPHOSPHONATE	756-79-6	MUTAGENESIS/GENETIC TOXICITY	C	
DIMETHYL MORPHOLINOPHOSPHORAMIDATE	597-25-1	MUTAGENESIS/GENETIC TOXICITY	C	
DIMETHYLOLDIHYDROXYETHYLENEUREA	1854-26-8	MUTAGENESIS/GENETIC TOXICITY	C	
DIMETHYLVINYL CHLORIDE	513-37-1	MUTAGENESIS/GENETIC TOXICITY	C	
EPIBROMOHYDRIN	3132-64-7	MUTAGENESIS/GENETIC TOXICITY	C	
ETHYLENE THIOUREA	96-45-7	MUTAGENESIS/GENETIC TOXICITY	A	
EUGENOL	97-53-0	MUTAGENESIS/GENETIC TOXICITY	C	
FURAN	110-00-9	MUTAGENESIS/GENETIC TOXICITY	C	
GLYCIDOL	556-52-5	MUTAGENESIS/GENETIC TOXICITY	C	
HEXAMETHYL-P-ROSANILINE CHLORIDE	548-62-9	MUTAGENESIS/GENETIC TOXICITY	A	
HYDROQUINONE	123-31-9	MUTAGENESIS/GENETIC TOXICITY	C	
N-(HYDROXYETHYL)ETHYLENEDIAMINE	111-41-1	MUTAGENESIS/GENETIC TOXICITY	C	
2-HYDROXY-1,4-NAPHTHOQUINONE	83-72-7	MUTAGENESIS/GENETIC TOXICITY	C	
ISATIN-5-SULFONIC ACID SODIUM SALT	80789-74-8	MUTAGENESIS/GENETIC TOXICITY	C	
ISOPRENE	78-79-5	MUTAGENESIS/GENETIC TOXICITY	C	
MONOISOPROPANOLAMINE	78-96-6	MUTAGENESIS/GENETIC TOXICITY	C	
ISOPROPYL GLYCIDYL ETHER	4016-14-2	MUTAGENESIS/GENETIC TOXICITY	C	
MALTOL	118-71-8	MUTAGENESIS/GENETIC TOXICITY	A	
MERCURIC CHLORIDE	7487-94-7	MUTAGENESIS/GENETIC TOXICITY	C	
METHACRYLONITRILE	126-98-7	MUTAGENESIS/GENETIC TOXICITY	A	
METHYL CARBAMATE	598-55-0	MUTAGENESIS/GENETIC TOXICITY	C	
NTA(NITRILOTRIACETIC ACID)	139-13-9	MUTAGENESIS/GENETIC TOXICITY	A	
OXYTETRACYCLINE HYDROCHLORIDE	2058-46-0	MUTAGENESIS/GENETIC TOXICITY	C	

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TOXICOLOGY TESTING

NATIONAL INSTITUTE OF ENVIRONMENTAL HEALTH SCIENCES
CONTRACTS
DROSOPHILA*

CHEMICAL	CAS NO.	TEST TYPE	STATUS	PERFORMING ORGANIZATION/PROJECT NO.
PENTAETHYLENEHEXAMINE	4067-16-7	MUTAGENESIS/GENETIC TOXICITY	C	
PHENESTERIN	3546-10-9	MUTAGENESIS/GENETIC TOXICITY	A	
RESERPINE	50-55-5	MUTAGENESIS/GENETIC TOXICITY	A	
RESORCINOL	108-46-3	MUTAGENESIS/GENETIC TOXICITY	C	
REXARSONE	121-19-7	MUTAGENESIS/GENETIC TOXICITY	C	
TETRACYCLINE HYDROCHLORIDE	64-75-5	MUTAGENESIS/GENETIC TOXICITY	C	
TETRAETHYLENEPENTAMINE	112-57-2	MUTAGENESIS/GENETIC TOXICITY	A	
TRIETHYLENETETRAMINE	112-24-3	MUTAGENESIS/GENETIC TOXICITY	C	

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NATIONAL INSTITUTE OF ENVIRONMENTAL HEALTH SCIENCES
TOXICOLOGY RESEARCH AND TESTING PROGRAM
LONG TERM ANIMAL STUDIES*

CHEMICAL	CAS NO.	TEST TYPE	STATUS	PERFORMING ORGANIZATION/PROJECT NO.
ACETONITRILE	75-05-8	CARCINOGENESIS	D	
ACID ORANGE NO. 3	6373-74-6	CARCINOGENESIS	B	TRACOR-JITCO/N01-CP-43350
ALLYL GLYCIDYL ETHER	106-92-3	CARCINOGENESIS	B	BATTELLE NORTHWEST
9-AMINOACRIDINE HYDROCHLORIDE	134-50-9	CARCINOGENESIS	B	BIOASSAY SYSTEMS
1-AMINO-2,4-DIBROMOANTHRAQUINONE	81-49-2	CARCINOGENESIS	B	MASON RES. INST.
2-AMINO-4-NITROPHENOL	99-57-0	CARCINOGENESIS	B	PHYSIOLOGICAL RES. LAB.
2-AMINO-5-NITROPHENOL	121-88-0	CARCINOGENESIS	B	PHYSIOLOGICAL RES. LAB.
DL-AMPHETAMINE SULFATE	60-13-9	CARCINOGENESIS	B	MICROBIOLOGICAL ASSOCIATES
AMPICILLIN TRIHYDRATE	7177-48-2	CARCINOGENESIS	B	SPRINGBORN INST. FOR BIORESEARCH
AZODICARBONAMIDE	123-77-3	CARCINOGENESIS	C	INTERNATIONAL R AND D CORP
BARIUM CHLORIDE DIHYDRATE	10326-27-9	CARCINOGENESIS	B	SRI INTERNATIONAL/N01-ES-28015
BENZALDEHYDE	100-52-7	CARCINOGENESIS	B	SOUTHERN RES INST/N01-CP-95651
BENZETHONIUM CHLORIDE	121-54-0	CARCINOGENESIS	C	PAPANICOLAOU RES. INST.
BENZOFURAN	271-89-6	CARCINOGENESIS	B	SPRINGBORN INST. FOR BIORESEARCH
BENZONITRILE	100-47-0	CARCINOGENESIS	C	
BENZO(F)-QUINOLINE	85-02-9	CARCINOGENESIS	C	
BENZOYL CHLORIDE	98-88-4	CARCINOGENESIS	D	
BENZYL ACETATE	140-11-4	CARCINOGENESIS	C	
BENZYL ALCOHOL	100-51-6	CARCINOGENESIS	B	MICROBIOLOGICAL ASSOC.
BENZYL CHLORIDE	100-44-7	CARCINOGENESIS	B	LITTON-FCRC/N01-CO-75380
O-BENZYL-P-CHLOROPHENOL	120-32-1	CARCINOGENESIS	B	BATTELLE-COLUMBUS/N01-CP-95653
2,2-BIS(BROMOMETHYL)-1,3-PROPANEDIOL	3296-90-0	CARCINOGENESIS	A	BIOASSAY SYSTEMS
BORIC ACID	10043-35-3	CARCINOGENESIS	B	MASON RESEARCH INST.
BROMOBENZENE	108-86-1	CARCINOGENESIS	B	BATTELLE NORTHWEST
BROMOBENZENE	108-86-1	CARCINOGENESIS	B	BATTELLE NORTHWEST
BROMODICHLOROMETHANE	75-27-4	CARCINOGENESIS	B	MASON RESEARCH INST.
BROMOFORM	75-25-2	CARCINOGENESIS	B	MASON RESEARCH INST.
1,3-BUTADIENE	106-99-0	CARCINOGENESIS	C	
2-BUTANONE PEROXIDE	1338-23-4	CARCINOGENESIS	B	GULF SOUTH RESEARCH INST.
T-BUTYL ALCOHOL	75-65-0	CARCINOGENESIS	B	GULF SOUTH RESEARCH INST.
BUTYL BENZYL PHTHALATE	85-68-7	CARCINOGENESIS	B	
N-BUTYL CHLORIDE	109-69-3	CARCINOGENESIS	A	MASON RESEARCH INST.
TERT-BUTYL PERBENZOATE	614-45-9	CARCINOGENESIS	C	BATTELLE COLUMBUS
BUTYRALDEHYDE	123-72-8	CARCINOGENESIS	C	LITTON BIONETICS
BUTYRALDEHYDE	123-72-8	CARCINOGENESIS	C	LITTON BIONETICS
GAMMA-BUTYROLACTONE	96-48-0	CARCINOGENESIS	B	SOUTHERN RES. INST.
CARISOPRODOL	78-44-4	CARCINOGENESIS	B	BIOASSAY SYSTEMS CORP./N01-ES-28004
D-CARVONE	2244-16-8	CARCINOGENESIS	B	INTERNATIONAL R AND D CORP.
CASTOR OIL	8001-79-4	CARCINOGENESIS	B	GULF SOUTH RES. INST.
CHLORAMINE	10599-90-3	CARCINOGENESIS	B	SOUTHERN RES. INST.
CHLORENDIC ACID	115-28-6	CARCINOGENESIS	A	HAZLETON
CHLORINATED TRISODIUM PHOSPHATE	56802-99-4	CARCINOGENESIS	A	MASON RES. INST./N01-CP-43350

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NATIONAL INSTITUTE OF ENVIRONMENTAL HEALTH SCIENCES
TOXICOLOGY RESEARCH AND TESTING PROGRAM
LONG TERM ANIMAL STUDIES*

CHEMICAL	CAS NO.	TEST TYPE	STATUS	PERFORMING ORGANIZATION/PROJECT NO.
CHLOROACETOPHENONE	532-27-4	CARCINOGENESIS	B	BATTELLE NORTHWEST
P-CHLOROANILINE	106-47-8	CARCINOGENESIS	B	BATTELLE-COLUMBUS
O-CHLOROBENZALMALONITRILE	2698-41-1	CARCINOGENESIS	B	BATTELLE NORTHWEST
3-CHLORO-2-METHYLPROPENE	563-47-3	CARCINOGENESIS	A	LITTON BIONETICS
4-CHLORO-2-NITROANILINE	89-63-4	CARCINOGENESIS	B	LITTON BIONETICS/N01-ES-28009
CHLOROWAX 40	63449-39-8	CARCINOGENESIS	A	SOUTHERN RES. INST.
CHLOROWAX 500C	63449-39-8	CARCINOGENESIS	A	SOUTHERN RES. INST.
CHLORPHENIRAMINE MALEATE	113-92-8	CARCINOGENESIS	B	BATTELLE COLUMBUS
C.I. ACID RED 114	6459-94-5	CARCINOGENESIS	B	HAZLETON/N01-CP-95655
C.I. BASIC RED 9	569-61-9	CARCINOGENESIS	A	MASON RESEARCH INST.
C.I. DIRECT BLUE 15	2429-74-5	CARCINOGENESIS	B	HAZLETON/N01-CP-95655
C.I. DIRECT BLUE 218	28407-37-6	CARCINOGENESIS	B	IRDC/N01-CP-05700
C.I. DIRECT YELLOW 11	1325-37-7	CARCINOGENESIS	D	NIEHS
C.I. PIGMENT RED 3	2425-85-6	CARCINOGENESIS	B	SOUTHERN RES. INST.
C.I. PIGMENT RED 23	6471-49-4	CARCINOGENESIS	B	SOUTHERN RES. INST.
CITRAL	5392-40-5	CARCINOGENESIS	D	
COCONUT OIL ACID (2 PARTS)-DIETHANOLAMINE (1 PART)	68603-42-9	CARCINOGENESIS	B	GULF SOUTH RES. INST.
CODEINE	76-57-3	CARCINOGENESIS	B	MASON RESEARCH INST.
COUMARIN	91-64-5	CARCINOGENESIS	B	BIOASSAY SYSTEMS
CROTONALDEHYDE	4170-30-3	CARCINOGENESIS	C	LITTON BIONETICS
CROTONALDEHYDE	4170-30-3	CARCINOGENESIS	C	LITTON BIONETICS
CYCLOHEXANONE	108-94-1	CARCINOGENESIS	B	FREDERICK CANCER RES. FACILITY
DECABROMODIPHENYL OXIDE	1163-19-5	CARCINOGENESIS	A	HAZLETON
2,4-DIAMINOPHENOL DIHYDROCHLORIDE	137-09-7	CARCINOGENESIS	B	MASON RES. INST.
4,4'-DIAMINO-2,2'-STILBENEDISULFONIC ACID	81-11-8	CARCINOGENESIS	B	INTERNATIONAL R AND D CORP.
2,3-DIBROMO-1-PROPANOL	96-13-9	CARCINOGENESIS	B	PAPANICOLAOU RES. INST.
P-DICHLOROBENZENE	106-46-7	CARCINOGENESIS	A	BATTELLE COLUMBUS
2,4-DICHLOROPHENOL	120-83-2	CARCINOGENESIS	B	BATTELLE COLUMBUS
DICHLORVOS	62-73-7	CARCINOGENESIS	B	SOUTHERN RES. INST.
DIESEL FUEL MARINE		CARCINOGENESIS SKIN PAINTING	 A	 LITTON BIONETICS, INC.
DIETHANOLAMINE	111-42-2	CARCINOGENESIS	B	GULF SOUTH RES. INST.
DIETHYL PHTHALATE	84-66-2	CARCINOGENESIS	B	LITTON BIONETICS
3,4-DIHYDROCOUMARIN	119-84-6	CARCINOGENSIS	B	BIOASSAY SYSTEMS
1,2-DIHYDRO-2,2,4-TRIMETHYL-				

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178<

NATIONAL INSTITUTE OF ENVIRONMENTAL HEALTH SCIENCES
TOXICOLOGY RESEARCH AND TESTING PROGRAM
LONG TERM ANIMAL STUDIES*

CHEMICAL	CAS NO.	TEST TYPE	STATUS	PERFORMING ORGANIZATION/PROJECT NO.
QUINOLINE	147-47-7	CARCINOGENESIS	C	SOUTHERN RES. INST.
DIMETHOXANE	828-00-2	CARCINOGENESIS	B	BATTELLE-COLUMBUS
3,3'-DIMETHOXYBENZIDINE	119-90-4	CARCINOGENESIS	B	HAZLETON/NO1-CP-95655
N,N-DIMETHYLANILINE	121-69-7	CARCINOGENESIS	B	SPRINGBORN INST. FOR BIORESEARCH
3,3'-DIMETHYLBENZIDINE	119-93-7	CARCINOGENESIS	B	HAZLETON/NO1-CP-95655
DIMETHYL METHYLPHOSPHONATE	756-79-6	CARCINOGENESIS	B	LITTON BIONETICS, INC.
DIMETHYL MORPHOLINOPHOSPHORAMIDATE	597-25-1	CARCINOGENESIS	A	LITTON BIONETICS, INC.
DIMETHYLOLDIHYDROXYETHYLENEUREA	1854-26-8	CARCINOGENESIS	B	INTERNATIONAL R AND D CORP.
DIMETHYL PHTHALATE	131-11-3	CARCINOGENESIS	B	LITTON BIONETICS, INC.
DIMETHYLVINYL CHLORIDE	513-37-1	CARCINOGENESIS	A	LITTON BIONETICS, INC.
DIPHENHYDRAMINE HYDROCHLORIDE	147-24-0	CARCINOGENESIS	B	SRI INTERNATIONAL
DIPHENYLHYDANTOIN	57-41-0	CARCINOGENESIS	B	BATTELLE-COLUMBUS LAB
DISPERSE BLUE NO. 1	2475-45-8	CARCINOGENESIS	A	SOUTHERN RESEARCH INST.
DMBA	57-97-6			
WITH TPA	41479-14-5	CARCINOGENESIS	B	GULF SOUTH RESEARCH INST.
DMBA/TPA/BPO (7,12-DIETHYL-BENZ(A)ANTH	57-97-6	CARCINOGENESIS	B	BATTELLE COLUMBUS
EPHEDRINE SULFATE	134-72-5	CARCINOGENESIS	B	PHYSIOLOGICAL RES. LAB.
EPINEPHRINE HYDROCHLORIDE	55-31-2	CARCINOGENESIS	B	BATTELLE NORTHWEST
1,2-EPOXYBUTANE	106-88-7	CARCINOGENESIS	B	BATTELLE NORTHWEST
1,2-EPOXYHEXADECANE	7320-37-8	CARCINOGENESIS	A	GULF SOUTH RESEARCH INST.
ERYTHROMYCIN STEARATE	643-22-1	CARCINOGENESIS	B	PHYSIOLOGICAL RES. LAB.
ETHYL BROMIDE	74-96-4	CARCINOGENESIS	B	BATTELLE NORTHWEST
ETHYL CHLORIDE	75-00-3	CARCINOGENESIS	B	BATTELLE NORTHWEST
ETHYLENE GLYCOL	107-21-1	CARCINOGENESIS	B	SOUTHERN RES. INST./NO1-CP-95651
ETHYLENE GLYCOL MONOETHYL ETHER	110-80-5	CARCINOGENESIS	B	GULF SOUTH RESEARCH INST.
ETHYLENE OXIDE	75-21-8	CARCINOGENESIS	B	BATTELLE NORTHWEST
ETHYLENE THIOUREA	96-45-7	CARCINOGENESIS	B	BATTELLE-COLUMBUS LAB
FURAN	110-00-9	CARCINOGENESIS	B	SOUTHERN RES. INST.
FURFURAL	98-01-1	CARCINOGENESIS	B	SOUTHERN RES. INST.
FUROSEMIDE	54-31-9	CARCINOGENESIS	B	SRI INTERNATIONAL
GLUTARALDEHYDE	111-30-8	CARCINOGENESIS	B	GULF SOUTH RESEARCH INST.
GLYCIDOL	556-52-5	CARCINOGENESIS	B	PAPANICOLAOU RES. INST.
GLYCOL(POLYSORBATE 80)	9005-65-6	CARCINOGENESIS	B	SOUTHERN RES. INST.
HC RED 3	2871-01-4	CARCINOGENESIS	A	SOUTHERN RESEARCH INST.
HC YELLOW 4	52551-67-4	CARCINOGENESIS	B	MASON RES. INST.
HEXACHLORO-1,3-BUTADIENE	87-68-3	CARCINOGENESIS	C	MICROBIOLOGICAL ASSOCIATES
HEXACHLOROCYCLOPENTADIENE	77-47-4	CARCINOGENESIS	B	BATTELLE NORTHWEST
HEXACHLOROETHANE	67-72-1	CARCINOGENESIS	B	MASON RES. INST.
1,6-HEXANEDIAMINE	124-09-4	CARCINOGENESIS	C	NIEHS
HEXYLRESORCINOL	136-77-6	CARCINOGENESIS	B	PHYSIOLOGICAL RES. LAB.
HYDROCHLOROTHIAZIDE	58-93-5	CARCINOGENESIS	B	SRI INTERNATIONAL
HYDROQUINONE	123-31-9	CARCINOGENESIS	B	BIOASSAY SYSTEMS

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TOXICOLOGY TESTING

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TOXICOLOGY RESEARCH AND TESTING PROGRAM
LONG TERM ANIMAL STUDIES*

CHEMICAL	CAS NO.	TEST TYPE	STATUS	PERFORMING ORGANIZATION/PROJECT NO.
4-HYDROXYACETANILIDE	103-90-2	CARCINOGENESIS	B	MASON RES. INST.
2-HYDROXY-4-METHOXYBENZOPHENONE	131-57-7	CARCINOGENESIS	C	MASON RES. INST.
2-HYDROXY-4-METHOXYBENZOPHENONE	131-57-7	CARCINOGENESIS	C	MASON RES. INST.
IODINATED GLYCEROL	5634-39-9	CARCINOGENESIS	B	MASON RESEARCH INST.
ISOBUTYL NITRITE	542-56-3	CARCINOGENESIS	B	INTERNATIONAL R AND D CORP.
ISOBUTYRALDEHYDE	78-84-2	CARCINOGENESIS	B	LITTON BIONETICS
ISOPHORONE	78-59-1	CARCINOGENESIS	A	PAPANICOLAOU RES. INST.
ISOPRENE	78-79-5	CARCINOGENESIS	C	
LAURIC ACID DIETHANOLAMINE	120-40-1	CARCINOGENESIS	B	GULF SOUTH RES. INST.
D-LIMONENE	5989-27-5	CARCINOGENESIS	B	MICROBIOLOGICAL ASSOC.
MALONALDEHYDE	542-78-9	CARCINOGENESIS	A	BATTELLE COLUMBUS
2-MERCAPTOBENZIMIDAZOLE	583-39-1	CARCINOGENESIS	B	LITTON BIONETICS/NO1-ES-28009
2-MERCAPTOBENZOTHIAZOLE	149-30-4	CARCINOGENESIS	B	PHYSIOLOGICAL RES. LAB.
MERCURIC CHLORIDE	7487-94-7	CARCINOGENESIS	B	INTERNATIONAL R AND D CORP.
METHDILAZINE	1982-37-2	CARCINOGENESIS	B	LITTON/NO1-CP-95652
8-METHOXYPSORALEN	298-81-7	CARCINOGENESIS	B	SRI INTERNATIONAL
ALPHA-METHYLBENZYL ALCOHOL	98-85-1	CARCINOGENESIS	B	MICROBIOLOGICAL ASSOC.
METHYL BROMIDE	74-83-9	CARCINOGENESIS	B	BROOKHAVEN NATL. LABS.
METHYL CARBAMATE	598-55-0	CARCINOGENESIS	B	MICROBIOLOGICAL ASSOC.
METHYLDOPA	555-30-6	CARCINOGENESIS	B	PHYSIOLOGICAL RES. LAB.
METHYLENE CHLORIDE	75-09-2	CARCINOGENESIS INHALATION	A	BATTELLE NORTHWEST
METHYL METHACRYLATE	80-62-6	CARCINOGENESIS	A	BATTELLE NORTHWEST
N-METHYLOLACRYLAMIDE	924-42-5	CARCINOGENESIS	B	BATTELLE-COLUMBUS
METHYLPHENIDATE HCl	298-59-9	CARCINOGENESIS	D	RALTECH/NO1-CP-05696
MIREX	2385-85-5	CARCINOGENESIS	B	LITTON-FCRC/NO1-CO-75380
MNNG/TPA/BPO (N-METHYL-N'-NITRO-N-NITR	70-25-7	CARCINOGENESIS	B	BATTELLE COLUMBUS
MOLYBDENUM TRIOXIDE	1313-27-5	CARCINOGENESIS	B	HAZLETON LABS/NO1-ES-28023
MONOCHLOROACETIC ACID	79-11-8	CARCINOGENESIS	B	INTERNATIONAL R AND D CORP.
NALIDIXIC ACID	389-08-2	CARCINOGENESIS	B	PHYSIOLOGICAL RES. LAB.
NAPHTHALENE	91-20-3	CARCINOGENESIS	B	NORTHROP
NAVY FUELS JP-5		CARCINOGENESIS SKIN PAINTING	A	LITTON BIONETICS, INC.
NICKEL OXIDE	1313-99-1	CARCINOGENESIS	C	LOVELACE RES. INST.
NICKEL SUBSULFIDE	12035-77-3	CARCINOGENESIS	C	LOVELACE RES. INST.
NICKEL SULFATE HEXAHYDRATE	10101-97-0	CARCINOGENESIS	C	LOVELACE RES. INST.
O-NITROANISOLE	91-23-6	CARCINOGENESIS	B	RALTECH/NO1-CP-05776

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LONG TERM ANIMAL STUDIES*

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NITROFURANTOIN	67-20-9	CARCINOGENESIS	B	SOUTHERN RES. INST.
NITROFURAZONE	59-87-0	CARCINOGENESIS	B	PHYSIOLOGICAL RES. LAB.
P-NITROPHENOL	100-02-7	CARCINOGENESIS	C	LITTON BIONETICS, INC.
P-NITROTOLUENE	99-99-0	CARCINOGENESIS	B	LITTON BIONETICS/NO1-ES-28009
OCHRATOXIN A	303-47-9	CARCINOGENESIS	B	BATTELLE-COLUMBUS
OLEIC ACID DIETHANOLAMINE SALT	13961-86-9	CARCINOGENESIS	B	GULF SOUTH RES. INST.
OXYTETRACYCLINE HCL	2058-46-0	CARCINOGENESIS	B	PHYSIOLOGICAL RES. LAB.
PENICILLIN V POTASSIUM	132-98-9	CARCINOGENESIS	B	SPRINGBORN INST. FOR BIORESEARCH
PENTACHLOROANISOLE	1825-21-4	CARCINOGENESIS	B	SOUTHERN RES. INST.
PENTACHLORONITROBENZENE	82-68-8	CARCINOGENESIS	B	MASON RESEARCH INST.
PENTACHLOROPHENOL, DOWICIDE EC-7	87-86-5	CARCINOGENESIS	B	BATTELLE COLUMBUS
PENTACHLOROPHENOL, TECHNICAL	87-86-5	CARCINOGENESIS	B	BATTELLE COLUMBUS
PENTAERYTHRITOL TETRANITRATE	78-11-5	CARCINOGENESIS	B	MASON RES. INST.
PHENYLBUTAZONE	50-33-9	CARCINOGENESIS	B	MASON RESEARCH INST.
PHENYLEPHRINE HYDROCHLORIDE	61-76-7	CARCINOGENESIS	B	PHYSIOLOGICAL RES. LAB.
N-PHENYL-2-NAPHTHYLAMINE	135-88-6	CARCINOGENESIS	B	BATTELLE COLUMBUS
O-PHENYLPHENOL	90-43-7	CARCINOGENESIS	A	BATTELLE COLUMBUS
POLYBROMINATED BIPHENYL (FF-I)	36355-01-8	CARCINOGENESIS	B	BATTELLE-COLUMBUS LAB
PROBENECID	57-66-9	CARCINOGENESIS	B	MASON RES. INST.
PROMETHAZINE HYDROCHLORIDE	58-33-3	CARCINOGENESIS	B	MASON RES. INST.
PYRIDINE	110-86-1	CARCINOGENESIS	A	GULF SOUTH RES. INST.
QUERCETIN	117-39-5	CARCINOGENESIS	B	MASON RES. INST.
RESORCINOL	108-46-3	CARCINOGENESIS	B	INTERNATIONAL R AND D CORP.
RHODAMINE 6G	989-38-8	CARCINOGENESIS	B	SOUTHERN RES. INST.
ROTENONE	83-79-4	CARCINOGENESIS	B	BATTELLE COLUMBUS
ROXARSONE	121-19-7	CARCINOGENESIS	B	SOUTHERN RES. INST.
SALICYLAZOSULFAPYRIDINE	599-79-1	CARCINOGENESIS	C	MASON RES. INST.
SCOPOLAMINE HYDROBROMIDE	51-34-3	CARCINOGENESIS	C	
SCOPOLAMINE HYDROBROMIDE	51-34-3	CARCINOGENESIS	C	
SODIUM AZIDE	26628-22-8	CARCINOGENESIS	B	MICROBIOLOGICAL ASSOCIATES
SODIUM DODECYL SULFATE	151-21-3	CARCINOGENESIS	A	GULF SOUTH RES. INST.
SODIUM FLUORIDE	7681-49-4	CARCINOGENESIS	B	BATTELLE COLUMBUS
STYRENE OXIDE	96-09-3	CARCINOGENESIS	B	LITTON-FCRC/NO1-CO-75380
SUCCINIC ANHYDRIDE	108-30-5	CARCINOGENESIS	B	MICROBIOLOGICAL ASSOC.
TALC	14807-96-6	CARCINOGENESIS	B	LOVELACE RES. INST.
TETRACHLOROETHYLENE	127-18-4	CARCINOGENESIS	B	BATTELLE NORTHWEST
TETRACHLOROETHYLENE	127-18-4	CARCINOGENESIS	A	GULF SOUTH RES. INST.
TETRACHLOROPHTHALIC ANHDRIDE	117-08-8	CARCINOGENESIS	C	MASON RESEARCH INSTITUTE
TETRACYCLINE HYDROCHLORIDE	64-75-5	CARCINOGENESIS	B	PHYSIOLOGICAL RES. LAB.
TETRAFLUOROETHYLENE	116-14-3	CARCINOGENESIS	C	
1-TRANS-DELTA-9-TETRAHYDROCANNABINOL	1972-08-3	CARCINOGENESIS	B	SRI INTERNATIONAL/NO1-ES-28015
TETRAHYDROFURAN	109-99-9	CARCINOGENESIS	C	

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LONG TERM ANIMAL STUDIES*

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TETRAHYDROFURAN	109-99-9	CARCINOGENESIS	C	
TETRANITROMETHANE	509-14-8	CARCINOGENESIS	B	MIDWEST RES. INST.
THEOPHYLLINE	58-55-9	CARCINOGENESIS	C	SOUTHERN RES. INST.
4,4'-THIOBIS(6-TERT-BUTYL-M-CRESOL)	96-69-5	CARCINOGENESIS	B	BIOASSAY SYSTEMS
THPC	124-64-1	CARCINOGENESIS	B	BATTELLE COLUMBUS
THPS	55566-30-8	CARCINOGENESIS	A	BATTELLE COLUMBUS
TITANIUM FERROCENE	1271-19-8	CARCINOGENESIS	B	MASON RES. INST.
D-ALPHA-TOCOPHERYL ACETATE	58-95-7	CARCINOGENESIS	B	MICROBIOLOGICAL ASSOC.
TOLUENE	108-88-3	CARCINOGENESIS	B	INTERNATIONAL R&D CORP.
TRIAMTERENE	396-01-0	CARCINOGENESIS	B	IRDC/NO1-CP-05700
TRICHLORFON	52-68-6	CARCINOGENESIS	A	GULF SOUTH RES. INST.
TRICHLOROETHYLENE	79-01-6	CARCINOGENESIS	A	PAPANICOLAOU RES. INST.
TRICHLOROETHYLENE	79-01-6	CARCINOGENESIS	A	PAPANICOLAOU RES. INST.
TRICHLOROETHYLENE	79-01-6	CARCINOGENESIS	A	PAPANICOLAOU RES. INST.
TRICHLOROETHYLENE	79-01-6	CARCINOGENESIS	A	PAPANICOLAOU RES. INST.
TRICHLOROETHYLENE (WITHOUT EPICHLOROHYDR)	79-01-6	CARCINOGENESIS	B	NIEHS
TRICHLOROETHYLENE (WITHOUT EPICHLOROHYDR)	79-01-6	CARCINOGENESIS	B	NIEHS
1,2,3-TRICHLOROPROPANE	96-18-4	CARCINOGENESIS	C	MASON RES. INST.
TRICRESYL PHOSPHATE	1330-78-5	CARCINOGENESIS	C	BATTELLE-COLUMBUS/NO1-CP-95653
TRIETHANOLAMINE	102-71-6	CARCINOGENESIS	B	
TRIS(2-CHLOROETHYL) PHOSPHATE	115-96-8	CARCINOGENESIS	B	MICROBIOLOGICAL ASSOCIATES
TUMERIC (CURCUMIN)	458-37-7	CARCINOGENESIS	B	MASON RES. INST./NO1-CP-95619
TUNGSTEN CARBIDE	12070-12-1	CARCINOGENESIS	B	BROOKHAVEN NATL. LAB.
4-VINYLCYCLOHEXENE	100-40-3	CARCINOGENESIS	A	LITTON BIONETICS, INC.
VINYL CYCLOHEXENE DIOXIDE	106-87-6	CARCINOGENESIS	B	BATTELLE-COLUMBUS
VINYLIDINE FLUORIDE	75-38-7	CARCINOGENESIS	B	LITTON BIONETICS/NO1-ES-28009
VINYLTOLUENE	25013-15-4	CARCINOGENESIS	B	MIDWEST RES. INST.
WOLLASTONITE CALCIUM SILICATE	13983-17-0	CARCINOGENESIS	B	NIEHS
XYLENE	1330-20-7	CARCINOGENESIS	A	BATTELLE COLUMBUS
XYLENESULFONIC ACID, SODIUM SALT	1300-72-7	CARCINOGENESIS	B	GULF SOUTH RES. INST.

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NATIONAL INSTITUTE OF ENVIRONMENTAL HEALTH SCIENCES
TOXICOLOGY RESEARCH AND TESTING PROGRAM
MAMMALIAN MUTAGENESIS - L5178Y MOUSE LYMPHOMA CELLS*

CHEMICAL	CAS NO.	TEST TYPE	STATUS	PERFORMING ORGANIZATION/PROJECT NO.
4-ACETYLAMINOFLUORENE	28322-02-3	MUTAGENESIS/GENETIC TOXICITY	A	ALL L5178Y ASSAYS ARE TO BE PERFORMED AT ONE OR BOTH OF THE FOLLOWING ORGANIZATIONS: LITTON BIONETICS, INC./N01-ES-28036 INVERESK RES. INTERN./N01-ES-28037
ALLYL ISOTHIOCYANATE	57-06-7	MUTAGENESIS/GENETIC TOXICITY	C	
3-AMINOTRIAZOLE	61-82-5	MUTAGENESIS/GENETIC TOXICITY	A	
11-AMINOUNDECANOIC ACID	2432-99-7	MUTAGENESIS/GENETIC TOXICITY	C	
L-ASCORBIC ACID	50-81-7	MUTAGENESIS/GENETIC TOXICITY	C	
BARIUM CHLORIDE DIHYDRATE	10326-27-9	MUTAGENESIS/GENETIC TOXICITY	C	
BENZYL ACETATE	140-11-4	MUTAGENESIS/GENETIC TOXICITY	C	
2-BIPHENYLAMINE HYDROCHLORIDE	2185-92-4	MUTAGENESIS/GENETIC TOXICITY	C	
BIS(2-CHLORO-1-METHYLETHYL) ETHER	108-60-1	MUTAGENESIS/GENETIC TOXICITY	C	
BISPHENOL A	80-05-7	MUTAGENESIS/GENETIC TOXICITY	C	
BORIC ACID	10043-35-3	MUTAGENESIS/GENETIC TOXICITY	A	
BUTYLATED HYDROXYTOLUENE	128-37-0	MUTAGENESIS/GENETIC TOXICITY	C	
BUTYL BENZYL PHTHALATE	85-68-7	MUTAGENESIS/GENETIC TOXICITY	C	
CADMIUM CHLORIDE	10108-64-2	MUTAGENESIS/GENETIC TOXICITY	C	
CALCIUM CHROMATE	13765-19-0	MUTAGENESIS/GENETIC TOXICITY	A	
CHLORDANE (TECHNICAL GRADE)	12789-03-6	MUTAGENESIS/GENETIC TOXICITY	C	
P-CHLOROANILINE	106-47-8	MUTAGENESIS/GENETIC TOXICITY	A	
CHLOROBENZILATE	510-15-6	MUTAGENESIS/GENETIC TOXICITY	A	
3-CHLOROMETHYLPYRIDINE HYDROCHLORIDE	6959-48-4	MUTAGENESIS/GENETIC TOXICITY	A	
4-CHLORO-2-NITROANILINE	89-63-4	MUTAGENESIS/GENETIC TOXICITY	C	
CHLOROTHALONIL	1897-45-6	MUTAGENESIS/GENETIC TOXICITY	C	
5-CHLORO-O-TOLUIDINE	95-79-4	MUTAGENESIS/GENETIC TOXICITY	C	
CHLORPHENIRAMINE MALEATE	113-92-8	MUTAGENESIS/GENETIC TOXICITY	A	
COCONUT DIETHANOLAMIDE	68603-42-9	MUTAGENESIS/GENETIC TOXICITY	C	
COUMAPHOS	56-72-4	MUTAGENESIS/GENETIC TOXICITY	C	
DIALLYL PHTHALATE	131-17-9	MUTAGENESIS/GENETIC TOXICITY	C	
DIAZINON	333-41-5	MUTAGENESIS/GENETIC TOXICITY	C	
DIBUTYLTIN DIACETATE	1067-33-0	MUTAGENESIS/GENETIC TOXICITY	C	
P-DICHLOROBENZENE	106-46-7	MUTAGENESIS/GENETIC TOXICITY	A	
1,2-DICHLOROBENZENE (O-DICHLOROBENZENE)	95-50-1	MUTAGENESIS/GENETIC TOXICITY	C	
DICHLORODIPHENYLETHYLENE	72-55-9	MUTAGENESIS/GENETIC TOXICITY	C	
DICHLOROMETHANE (METHYLENE CHLORIDE)	75-09-2	MUTAGENESIS/GENETIC TOXICITY	C	
N,N'-DICYCLOHEXYLTHIOUREA	1212-29-9	MUTAGENESIS/GENETIC TOXICITY	A	
DIETHANOLAMINE	111-42-2	MUTAGENESIS/GENETIC TOXICITY	C	
DI(2-ETHYLHEX-YL)ADIPATE	103-23-1	MUTAGENESIS/GENETIC TOXICITY	C	
N,N'-DIETHYLTHIOUREA	105-55-5	MUTAGENESIS/GENETIC TOXICITY	C	
DIGLYCIDYL RESORCINOL ETHER	101-90-6	MUTAGENESIS/GENETIC TOXICITY	C	
2,4-DIMETHOXYANILINE HYDROCHLORIDE	54150-69-5	MUTAGENESIS/GENETIC TOXICITY	C	

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TOXICOLOGY RESEARCH AND TESTING PROGRAM
MAMMALIAN MUTAGENESIS - L5178Y MOUSE LYMPHOMA CELLS*

CHEMICAL	CAS NO.	TEST TYPE	STATUS	PERFORMING ORGANIZATION/PROJECT NO.
1,4-DIOXANE	123-91-1	MUTAGENESIS/GENETIC TOXICITY	C	
DIPHENHYDRAMINE HYDROCHLORIDE	147-24-0	MUTAGENESIS/GENETIC TOXICITY	C	
ENDRIN	72-20-8	MUTAGENESIS/GENETIC TOXICITY	C	
EPHEDRINE SULFATE	134-72-5	MUTAGENESIS/GENETIC TOXICITY	C	
1,2-EPOXYBUTANE	106-88-7	MUTAGENESIS/GENETIC TOXICITY	A	
1,2-EPOXYHEXADECANE	7320-37-8	MUTAGENESIS/GENETIC TOXICITY	C	
ERYTHROMYCIN STEARATE	643-22-1	MUTAGENESIS/GENETIC TOXICITY	A	
2-ETHOXYETHANOL (EGMEE)	110-80-5	MUTAGENESIS/GENETIC TOXICITY	C	
ETHYLENEDIAMINE TETRAACETIC ACID (EDTA)	150-38-9	MUTAGENESIS/GENETIC TOXICITY	C	
ETHYLENE THIOUREA	96-45-7	MUTAGENESIS/GENETIC TOXICITY	A	
MONO(2-ETHYLHEXYL)ADIPATE	4337-65-9	MUTAGENESIS/GENETIC TOXICITY	C	
FERRIC CHLORIDE	7705-08-0	MUTAGENESIS/GENETIC TOXICITY	C	
FLUOMETURON	2164-17-2	MUTAGENESIS/GENETIC TOXICITY	C	
FURAN	110-00-9	MUTAGENESIS/GENETIC TOXICITY	C	
FUROSEMIDE	54-31-9	MUTAGENESIS/GENETIC TOXICITY	C	
HC BLUE 2	33229-34-4	MUTAGENESIS/GENETIC TOXICITY	C	
HEPTACHLOR	76-44-8	MUTAGENESIS/GENETIC TOXICITY	C	
HEXACHLOROETHANE	67-72-1	MUTAGENESIS/GENETIC TOXICITY	A	
IRON DEXTRAN	9004-66-4	MUTAGENESIS/GENETIC TOXICITY	C	
ISOBUTYRALDEHYDE	78-84-2	MUTAGENESIS/GENETIC TOXICITY	C	
LAURIC ACID DIETHANOLAMINE CONDENSATE	120-40-1	MUTAGENESIS/GENETIC TOXICITY	C	
D-LIMONENE	5989-27-5	MUTAGENESIS/GENETIC TOXICITY	C	
MALATHION	121-75-5	MUTAGENESIS/GENETIC TOXICITY	C	
D-MANNITOL	69-65-8	MUTAGENESIS/GENETIC TOXICITY	C	
MELAMINE	108-78-1	MUTAGENESIS/GENETIC TOXICITY	C	
2-MERCAPTOBENZIMIDAZOLE	583-39-1	MUTAGENESIS/GENETIC TOXICITY	C	
MERCAPTOBENZOTHIAZOLE	149-30-4	MUTAGENESIS/GENETIC TOXICITY	C	
MERCURIC CHLORIDE	7487-94-7	MUTAGENESIS/GENETIC TOXICITY	A	
METHAPYRILENE HYDROCHLORIDE	135-23-9	MUTAGENESIS/GENETIC TOXICITY	C	
ALPHA-METHYLBENZYL ALCOHOL	98-85-1	MUTAGENESIS/GENETIC TOXICITY	C	
METHYL CARBAMATE	598-55-0	MUTAGENESIS/GENETIC TOXICITY	A	
METHYLDOPA	555-30-6	MUTAGENESIS/GENETIC TOXICITY	C	
METHYL VIOLOGEN	1910-42-5	MUTAGENESIS/GENETIC TOXICITY	C	
MOLYBDENUM TRIOXIDE	1313-27-5	MUTAGENESIS/GENETIC TOXICITY	C	
NICKEL SULFATE HEXAHYDRATE	10101-97-0	MUTAGENESIS/GENETIC TOXICITY	C	

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TOXICOLOGY RESEARCH AND TESTING PROGRAM
MAMMALIAN MUTAGENESIS - L5178Y MOUSE LYMPHOMA CELLS*

185<

CHEMICAL	CAS NO.	TEST TYPE	STATUS	PERFORMING ORGANIZATION/PROJECT NO.
NITROFURANTOIN	67-20-9	MUTAGENESIS/GENETIC TOXICITY	C	
P-NITROTOLUENE	99-99-0	MUTAGENESIS/GENETIC TOXICITY	C	
OLEIC ACID DIETHANOLAMINE	13961-86-9	MUTAGENESIS/GENETIC TOXICITY	C	
OXYTETRACYCLINE HYDROCHLORIDE	2058-46-0	MUTAGENESIS/GENETIC TOXICITY	A	
PENTACHLOROETHANE	76-01-7	MUTAGENESIS/GENETIC TOXICITY	C	
PENTACHLORONITROBENZENE	82-68-8	MUTAGENESIS/GENETIC TOXICITY	C	
PHENAZOPYRIDINE HYDROCHLORIDE	136-40-3	MUTAGENESIS/GENETIC TOXICITY	C	
PHENESTERIN	3546-10-9	MUTAGENESIS/GENETIC TOXICITY	C	
PHENOL	108-95-2	MUTAGENESIS/GENETIC TOXICITY	C	
PHTHALAMIDE	88-96-0	MUTAGENESIS/GENETIC TOXICITY	C	
POTASSIUM CHLORIDE	7447-40-7	MUTAGENESIS/GENETIC TOXICITY	A	
QUINOLINE	91-22-5	MUTAGENESIS/GENETIC TOXICITY	C	
ROTENONE	83-79-4	MUTAGENESIS/GENETIC TOXICITY	C	
ROXARSONE	121-19-7	MUTAGENESIS/GENETIC TOXICITY	C	
SODIUM DODECYL SULFATE	151-21-3	MUTAGENESIS/GENETIC TOXICITY	A	
SODIUM FLUORIDE	7681-49-4	MUTAGENESIS/GENETIC TOXICITY	A	
SODIUM XYLENESULFONATE	1300-72-7	MUTAGENESIS/GENETIC TOXICITY	C	
STANNOUS CHLORIDE	7772-99-8	MUTAGENESIS/GENETIC TOXICITY	C	
SUCCINIC ACID 2,2-DIMETHYL-HYDRAZIDE	1596-84-5	MUTAGENESIS/GENETIC TOXICITY	C	
SUCROSE	57-50-1	MUTAGENESIS/GENETIC TOXICITY	A	
4,4'-SULFONYLDIANILINE	80-08-0	MUTAGENESIS/GENETIC TOXICITY	C	
1,1,2,2-TETRACHLOROETHANE	79-34-5	MUTAGENESIS/GENETIC TOXICITY	C	
TETRACHLOROETHYLENE	127-18-4	MUTAGENESIS/GENETIC TOXICITY	A	
2,3,5,6-TETRACHLORO-4-NITROANISOLE	2438-88-2	MUTAGENESIS/GENETIC TOXICITY	C	
TETRAKIS(HYDROXYMETHYL) PHOSPHONIUM SULFATE	55566-30-8	MUTAGENESIS/GENETIC TOXICITY	C	
TITANIUM OXIDE	13463-67-7	MUTAGENESIS/GENETIC TOXICITY	A	
TOLUENE	108-88-3	MUTAGENESIS/GENETIC TOXICITY	A	
2,6-TOLUENEDIAMINE DIHYDRO-CHLORIDE	15481-70-6	MUTAGENESIS/GENETIC TOXICITY	C	
2,4,5-TRIMETHOXYBENZALDEHYDE	4460-86-0	MUTAGENESIS/GENETIC TOXICITY	C	
TRIMETHYLTHIOUREA	2489-77-2	MUTAGENESIS/GENETIC TOXICITY	C	
4-VINYLCYCLOHEXENE	100-40-3	MUTAGENESIS/GENETIC TOXICITY	C	
VINYLIDENE CHLORIDE (1,1-DICHLOROETHYLENE	75-35-4	MUTAGENESIS/GENETIC TOXICITY	C	

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TOXICOLOGY TESTING

FOOD AND DRUG ADMINISTRATION
CENTER FOR FOOD SAFETY AND APPLIED NUTRITION

CHEMICAL	CAS NO.	TEST TYPE	STATUS	PERFORMING ORGANIZATION/PROJECT NO.
ACETOETHYLTETRAMETHYLTETRALIN		DERMAL TOXICITY	B	DIV. TOXICOL./10162
ACETOETHYLTETRAMETHYLTETRALIN		SYSTEMIC/ORGAN TOXICITY	B	DIV. TOXICOL./10162
AFLATOXIN	1402-68-2	BIOCHEMICAL/CELLULAR/TISSUE EFFECTS	C	DIV. TOXICOL./09596
AFLATOXIN	1402-68-2	CLINICAL TOXICOLOGY/EPIDEMIOLOGY	B	EPIDEMIOL. UNIT
AFLATOXIN	1402-68-2	CLINICAL TOXICOLOGY/EPIDEMIOLOGY	C	EPIDEMIOL. UNIT & NIEHS
ANTHRACENE	120-12-7	SYSTEMIC/ORGAN TOXICITY	A	DIV. TOXICOL./08980
ASCORBIC ACID	50-81-7	BIOCHEMICAL/CELLULAR/TISSUE EFFECTS PHARMACOKINETICS/METABOLISM	B	DIV. NUTRITION/PMS NO. 09487
CADMIUM	7440-43-9	NUTRITIONAL STUDIES/PHARMACOKINETCS/METABOLISM	D	DIV. NUTRITION/00384
CADMIUM CHLORIDE	10108-64-2	BIOCHEMICAL/CELLULAR/TISSUE EFFECTS	A	DIV. TOXICOL./09596
CADMIUM METALLOTHIONEN		ACUTE/CHRONIC TOXICITY	B	DIV. TOXICOL./00022
CAFFEINE	58-08-2	REPRODUCTION/DEVELOPMENTAL TOXICITY	B	DIV. TOXICOL./09687
CAFFEINE	58-08-2	NEUROLOGIC/BEHAVIORAL TOXICITY	A	DIV. TOXICOL./08855
CAFFEINE	58-08-2	BIOCHEMICAL/CELLULAR/TISSUE EFFECTS	C	DIV. TOXICOL./09596
CAFFEINE	58-08-2	IMMUNOLOGIC TOXICITY	A	DIV. TOXICOL./11198
CHOLESTEROL OXIDES		PHARMACOKINETICS/METABOLISM/BIOCHEMICAL/CELLULAR/TISSUE EFFECTS	D	DIV. NUTRITION/00373
CITRININ	518-75-2	BIOCHEMICAL/CELLULAR/TISSUE EFFECTS	A	DIV. TOXICOL./09596
COMFREY ROOT, DOMESTIC		SUBCHRONIC TOXICITY SYSTEMIC/ORGAN TOXICITY	C	DIV. TOXICOL./09596
COMFREY ROOT, IMPORTED		ACUTE/CHRONIC/TOXICITY SYSTEMIC/ORGAN TOXICITY	D	DIV. TOXICOL./09596
COPPER		IMMUNOLOGIC TOXICITY/NUTRITIONAL STUDIES	C	DIV. NUTRITION/11778
D AND C ORANGE			A	DIVISION OF TOXICOLOGY/10162
D AND C RED 9	5160-02-1		B	DIVISION OF TOXICOLOGY/10162
DIOXANE	123-91-1	SYSTEMIC/ORGAN TOXICITY	A	DIV. TOXICOL./10162
TRANS FATTY ACIDS		BIOCHEMICAL/CELLULAR/TISSUE EFFECTS PHARMACOKINETICS/METABOLISM	D	DIV. NUTRITION/00373
FD AND C RED NO. 40	25956-17-6	REPRODUCTIVE/DEVELOPMENTAL TOXICITY	B	DIV. TOXICOL./06393
FD AND C YELLOW NO. 5	1934-21-0	REPRODUCTIVE/DEVELOPMENTAL TOXICITY	B	DIV. TOXICOL./09681
GLUTARALDEHYDE	111-30-8	SUBCHRONIC TOXICITY	B	DIV. TOXICOL./08399
GUAR GUM	9000-30-0	REPRODUCTIVE/DEVELOPMENTAL TOXICITY	A	DIV. TOXICOL./09687
GUM ARABIC	9000-01-5	REPRODUCTIVE/DEVELOPMENTAL TOXICITY	B	DIV. TOXICOL./09687
GUM ARABIC	9000-01-5	ACUTE/CHRONIC/TOXICITY SYSTEMIC/ORGAN TOXICITY	A	DIV. TOXICOL./08377

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187<

TOXICOLOGY TESTING

FOOD AND DRUG ADMINISTRATION
CENTER FOR FOOD SAFETY AND APPLIED NUTRITION

CHEMICAL	CAS NO.	TEST TYPE	STATUS	PERFORMING ORGANIZATION/PROJECT NO.
GUM TRAGACANTH		ACUTE/CHRONIC/TOXICITY		
		SYSTEMIC/ORGAN TOXICITY	B	DIV. TOXICOL./08377
HEAT STABLE TOXIN OF E. COLI		GENETIC TOXICITY	B	LITTON BIOMETICS FOR DM/223-80-2295
IONOPHORE (A23187)	52665-69-7	NEUROLOGIC/BEHAVIORAL TOXICITY	A	DIVISION OF TOXICOLOGY/08855
MANGANESE	7439-96-5	NUTRITIONAL STUDIES		
MANNITOL		PHARMACOKINETICS/METABOLISM	B	DIV. NUTRITION/PMS NO. 09847
		ACUTE/CHRONIC TOXICITY		
		SYSTEMIC/ORGAN TOXICITY	C	DIV. TOXICOL./08377
5-METHOXYPSORALEN	484-20-8	BIOCHEMICAL/CELLULAR/TISSUE EFFECTS	B	DIVISION OF TOXICOLOGY/11756
8-METHOXYPSORALEN	298-81-7	PHOTOTOXICITY	B	DIV. TOXICOL./10162
8-METHOXYPSORALEN	298-81-7	OCULAR TOXICITY	A	DIV. TOXICOL./11290
METHYL MERCURY	22967-92-6	CLINICAL TOXICOLOGY/EPIDEMIOLOGY	C	UNIV. OF ROCHESTER
METHYL XANTHINES		IMMUNOLOGIC TOXICITY	A	DIVISION OF TOXICOLOGY/11198
N-NITROSO-N-METHYLDODECYLAMINE	75356-79-5	DERMAL TOXICITY	B	DIVISION OF TOXOCOLOGY/10162
N-NITROSO-N-METHYLOCTADECYLAMINE		DERMAL TOXICITY	B	DIVISION OF TOXICOLOGY/10162
OCHRATOXIN	37203-43-3	CLINICAL TOXICOLOGY/EPIDEMIOLOGY	C	PURDUE UNIV.
PBB'S		CLINICAL TOXICOLOGY/EPIDEMIOLOGY	B	MICH. DEPT. PUB. HLTH.
PENTACHLOROANISOLE	1825-21-4	REPRODUCTIVE/DEVELOPMENTAL TOXICITY	A	DIV. TOXICOL./09687
PENTACHLOROPHENOL	87-86-5	ACUTE/CHRONIC TOXICITY	A	DIV. TOXICOL./11165
PENTACHLOROPHENOL	87-86-5	REPRODUCTIVE/DEVELOPMENTAL TOXICITY	A	DIV. TOXICOL./09687
PSORALEN	66-97-7	BIOCHEMICAL/CELLULAR/TISSUE EFFECTS		/11756
SACCHARIN	81-07-2	ACUTE/CHRONIC TOXICITY	A	DIV. TOXICOL./08355
SELENIUM	7782-49-2	BIOCHEMICAL/CELLULAR/TISSUE EFFECTS		
		PHARMACOKINETICS/METABOLISM		
SORBITOL		SUBCHRONIC TOXICITY	B	DIV. NUTRITION/PMS NO. 09847
		ACUTE/CHRONIC TOXICITY		
		SYSTEMIC/ORGAN TOXICITY	C	DIV. TOXICOL./08377
STAPHYLOCOCCAL ENTEROTOXINS		IMMUNOLOGIC TOXICITY	B	DIV. MICROBIOL./11778
TENUAZONIC ACID		IMMUNOLOGIC TOXICITY	B	DIV. MICROBIOLOGY/127049
TRIMETHYL-PSORALEN	3902-71-4	BIOCHEMICAL/CELLULAR/TISSUE EFFECTS	A	/11756
TRIPHENYL PHOSPHATE	115-86-6	ACUTE/CHRONIC TOXICITY	A	DIV. TOXICOL./06122
TRIPHENYL PHOSPHATE	115-86-6	REPRODUCTIVE/DEVELOPMENTAL TOXICITY	A	DIV. TOXICOL./06122
VITAMIN E		BIOCHEMICAL/CELLULAR/TISSUE EFFECTS		
		SUBCHRONIC TOXICITY		
		NUTRITIONAL STUDIES	A	DIV. NUTRITION/09847
VOMITOXIN	17924-92-4	BIOCHEMICAL EFFECTS (IN VITRO)	A	DIV. TOXICOL.
XYLITOL		ACUTE/CHRONIC TOXICITY		
		SYSTEMIC/ORGAN TOXICITY	C	DIV. TOXICOL./08377
ZEARALENONE	17924-92-4	BIOCHEMICAL/CELLULAR/TISSUE EFFECTS	B	DIV. TOXICOL./09596

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TOXICOLOGY TESTING

FOOD AND DRUG ADMINISTRATION
CENTER FOR VETERINARY MEDICINE

CHEMICAL	CAS NO.	TEST TYPE	STATUS	PERFORMING ORGANIZATION/PROJECT NO.
BUNAMIDINE	3748-77-4			
WITH BUTAMISOLE	54400-59-8	ACUTE/CHRONIC TOXICITY	A	DVMR/220
DIOXINE		ACUTE/CHRONIC TOXICITY		
		BIOCHEMICAL/CELLULAR/TISSUE EFFECTS		
		PHARMACOKINETICS/METABOLISM	C	
GENTIAN VIOLET	548-62-9	ACUTE/CHRONIC TOXICITY	A	NCTR
PENTACHLOROPHENOL		ACUTE/CHRONIC TOXICITY		
		BIOCHEMICAL/CELLULAR/TISSUE EFFECTS		
		PHARMACOKINETICS/METABOLISM	C	EXTRAMURAL/BVM-10-84
SULFAMETHAZINE	57-68-1	ACUTE/CHRONIC TOXICITY	B	NCTR

188<

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TOXICOLOGY TESTING

FOOD AND DRUG ADMINISTRATION
NATIONAL CENTER FOR TOXICOLOGICAL RESEARCH

CHEMICAL	CAS NO.	TEST TYPE	STATUS	PERFORMING ORGANIZATION/PROJECT NO.
ACETAMINOPHEN	103-90-2	BIOCHEMICAL/CELLULAR/TISSUE EFFECTS		
		PHARMACOKINETICS/METABOLISM		
		SYSTEMIC/ORGAN TOXICITY/CARCINOGENESIS	B	DIV. OF CARCINOGENESIS/EXP. 6098, 6232
ACETOLAMIDE		SYSTEMIC/ORGAN TOXICITY/CARCINOGENESIS	B	DIV. CARCINOGENESIS/EXP. 318
N-ACETOXY-2-ACETYLAMINOFLUORENE	6098-44-8	BIOCHEMICAL/CELLULAR/TISSUE EFFECTS	B	DIV. CARCINOGENESIS/EXP. 341
N-ACETOXY-N-ACETYL-1-AMINOPYRENE		MUTAGENESIS/GENETIC TOXICITY	B	DIV. CARCINOGENESIS/EXP. 6187
N-ACETOXY-AMINOFLUORENE		MUTAGENESIS/GENETIC TOXICITY	B	DIV. MUTAGENESIS
N-ACETOXY-AMINOFLUORENE		CARCINOGENESIS	B	DIV. MUTAGENESIS
N-ACETOXY-N-TRIFLUOROACETYL-4--AMINOBIPHENYL		IMMUNOLOGIC TOXICITY	B	DIV. CARCINOGENESIS
N-ACETYL-2-AMINOFLUORENE	53-96-3	CARCINOGENESIS	B	DIV. CHEMISTRY/EXP. 6012
2-ACETYLAMINOFLUORENE	53-96-3	NUTRITIONAL STUDIES	B	DIV. CHEM. TOXICOL./EXP. 346
2-ACETYLAMINOFLUORENE	53-96-3	REPRODUCTIVE/DEVELOPMENTAL TOXICITY	C	DIV. CHEM. TOXICOL.
2-ACETYLAMINOFLUORENE	53-96-3	MUTAGENESIS/GENETIC TOXICITY	B	DIV. MUTAGENESIS/EXP. 160
2-ACETYLAMINOFLUORENE	53-96-3	CARCINOGENESIS	A	ASSOC. DIR.CHEM. EVALUATION/EXP. 272
2-ACETYLAMINOFLUORENE	53-96-3	CARCINOGENESIS	B	DIV. CARCINOGENESIS
2-ACETYLAMINOFLUORENE	53-96-3	CARCINOGENESIS	B	DIV. CHEM. TOXICOL./EXP. 328
(3H)-N-ACETYL-2-AMINOFLUORENE		BIOCHEMICAL/CELLULAR/TISSUE EFFECTS	B	DIV. CARCINOGENESIS/EXP. 211/387
N-ACETYL-1-AMINOPYRENE		MUTAGENESIS/GENETIC TOXICITY	B	DIV. CARCINOGENESIS
N-ACETYLBENZIDINE	3366-61-8	CARCINOGENESIS	B	DIV. CARCINOGENESIS/EXP. 211
N-ACETYL-P-BENZOQUINONEIMINE	50700-49-7	BIOCHEMICAL/CELLULAR/TISSUE EFFECTS	B	DIV. CARCINOGENESIS/EXP. 6098/6232
N-ACETYL-N-HYDROXY-2-AMINOFLUORENE	30651-40-2	BIOCHEMICAL/CELLULAR/TISSUE EFFECTS	A	DIV. CHEM. TOXICOL./EXP. 186
N-ACETYL-N-HYDROXY-1-AMINOPYRENE		MUTAGENESIS/GENETIC TOXICITY	B	DIV. CARCINOGENESIS/EXP. 6187/6131
N4-ACETYLSULFAMETHAZINE	100-90-3	MUTAGENESIS/GENETIC TOXICITY	B	DIV. CARCINOGENESIS/EXP. 6285
N4-ACETYLSULFAMETHAZINE	100-90-3	PHARMACOKINETICS/METABOLISM	B	DIV. CARCINOGENESIS/EXP. 6285
ACTINOMYCIN D	50-76-0	BIOCHEMICAL/CELLULAR/TISSUE EFFECTS	B	DIV. CARCINOGENESIS/EXP.641
AFLATOXIN (INACTIVATED)	1402-68-2	BIOCHEMICAL/CELLULAR/TISSUE EFFECTS	A	DIV. TERATOGENESIS/TDMS IAG USDA/EXP 940-943
ALLYL CHLORIDE	107-05-1	REPRODUCTIVE/DEVELOPMENTAL TOXICITY	B	INVERESK RES. INT., LTD. NIOSH CONTRACT 2210-78-0026
6-AMINOBENZO(A)PYRENE	7428-83-3	PHARMACOKINETICS/METABOLISM	B	DIV. CARCINOGENESIS/EXP. 275/276
6-AMINOBENZO(A)PYRENE	7428-83-3	CARCINOGENESIS	B	DIV. CARCINOGENESIS/EXP. 275/276
6-AMINOBENZO(A)PYRENE	7428-83-3	MUTAGENESIS/GENETIC TOXICITY	B	DIV. CARCINOGENESIS/EXP. 275/276
6-AMINOBENZO(A)PYRENE	7428-83-3	PHARMACOKINETICS/METABOLISM	B	DIV. CARCINOGENESIS/EXP. 275/276
(3H)4-AMINOBIPHENYL		BIOCHEMICAL/CELLULAR/TISSUE EFFECTS	B	DIV. CARCINOGENESIS/EXP. 211/387
4-AMINOBIPHENYL	92-67-1	IMMUNOLOGIC TOXICITY	B	DIV. CARCINOGENESIS/EXP. 211
2-AMINOFLUORENE	153-78-6	MUTAGENESIS/GENETIC TOXICITY	B	DIV. MUTAGENESIS/EXP. 275
2-AMINOFLUORENE	153-78-6	CARCINOGENESIS	B	DIV. MUTAGENESIS/EXP. 275
1-AMINOPYRENE	1606-67-3	MUTAGENESIS/GENETIC TOXICITY	B	DIV. CARCINOGENESIS/EXP. 6191/6187

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TOXICOLOGY TESTING

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NATIONAL CENTER FOR TOXICOLOGICAL RESEARCH

CHEMICAL	CAS NO.	TEST TYPE	STATUS	PERFORMING ORGANIZATION/PROJECT NO.
(3H)-1-AMINOPYRENE		MUTAGENESIS/GENETIC TOXICITY	B	DIVISION OF CARCINOGENESIS/EXP. 6187
3-AMINOPYRENOL		PHARMACOKINETICS/METABOLISM	B	DIV. CARCINOGENESIS/EXP. 6187
6-AMINOPYRENOL		PHARMACOKINETICS/METABOLISM	B	DIV. CARCINOGENESIS/EXP. 6187
8-AMINOPYRENOL		PHARMACOKINETICS/METABOLISM	B	DIV. CARCINOGENESIS/EXP. 6187
D-AMPHETAMINE	51-63-8	BEHAVIOR	A	DIV. TERATOGENESIS/EXP. 6326,6322
D-AMPHETAMINE SULFATE	51-63-8	NEUROLOGIC/BEHAVIORAL TOXICITY	B	DIV. TERATOGENESIS EXP. 255/285/6172
AROCHLOR 1254	11097-69-1	CARCINOGENESIS	B	DIV. TERATOGENESIS/DIV. CARCINOGENESIS EXP. 6187
ASCORBIC ACID	50-81-7	BIOCHEMICAL/CELLULAR/TISSUE EFFECTS	B	DIV. CARCINOGENESIS/EXP. 6094/6187
BENZANTHRACENE	56-55-3	CARCINOGENESIS	B	DIV. MUTAGENESIS/EXP. 275
BENZANTHRACENE	56-55-3	MUTAGENESIS/GENETIC TOXICITY	B	DIV. MUTAGENESIS/EXP. 275
BENZO(A)ANTHRACENE-TRANS-10,11--DIHYDRODIOL	60967-90-0	PHARMACOKINETICS/METABOLISM	B	DIV. CARCINOGENESIS/EXP. 276
BENZO(A)ANTHRACENE-TRANS-1,2-DIHYDRODIOL	60967-88-6	PHARMACOKINETICS/METABOLISM	B	DIV. CARCINOGENESIS/EXP. 276
BENZO(A)ANTHRACENE-TRANS-8,9-DIOL-10,11-EPOXIDE		PHARMACOKINETICS/METABOLISM	B	DIV. CARCINOGENESIS/EXP. 276
BENZO(A)PYRENE	50-32-8	MUTAGENESIS/GENETIC TOXICITY	B	DIV. MUTAGENESIS/EXP. 160
BENZO(A)PYRENE	50-32-8	CARCINOGENESIS	B	DIV. MUTAGENESIS/EXP. 160
BENZO(A)PYRENE-CIS-7,8-DIHYDRODIOL	60657-25-2	PHARMACOKINETICS/METABOLISM	B	DIV. CARCINOGENESIS/EXP. 276
BENZO(A)PYRENE-CIS-7,8-DIHYDRODIOL	60657-25-2	CARCINOGENESIS	B	DIV. CARCINOGENESIS/EXP. 276
BENZO(A)PYRENE-CIS-7,8-DIHYDRODIOL	60657-25-2	MUTAGENESIS/GENETIC TOXICITY	B	DIV. CARCINOGENESIS/EXP. 276
BENZO(A)PYRENE-TRANS-7,8-DIHYDRODIOL	57404-88-3	BIOCHEMICAL/CELLULAR/TISSUE EFFECTS	B	DIV. CARCINOGENESIS/EXP. 276
BENZO(A)PYRENE-TRANS-9,10-DIHYDRODIOL	74634-55-2	PHARMACOKINETICS/METABOLISM	B	DIV. CARCINOGENESIS/EXP. 276
BENZO(A)PYRENE-TRANS-9,10-DIHYDRODIOL	74634-55-2	BIOCHEMICAL/CELLULAR/TISSUE EFFECTS	B	DIV. CARCINOGENESIS/EXP. 276
BENZO(A)PYRENE-7,8-DIOL	57303-99-8	PHARMACOKINETICS/METABOLISM	B	DIV. CARCINOGENESIS/EXP. 276
BENZO(A)PYRENE-TRANS-7,8-DIOL--ANTI-9,10-EPOXIDE		BIOCHEMICAL/CELLULAR/TISSUE EFFECTS	B	DIV. CARCINOGENESIS/EXP. 276
N-BENZOYLOXY-N-METHYL-4-AMINOBENZENE		PHARMACOKINETICS/METABOLISM	B	DIV. CARCINOGENESIS/EXP. 210

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N-BUTYL ACETATE	123-86-4	REPRODUCTIVE/DEVELOPMENTAL TOXICITY	B	DIV. TERATOLOGY/CONTRACT NOT AWARDED
N-BUTYL ACRYLATE	141-32-2	REPRODUCTIVE/DEVELOPMENTAL TOXICITY	D	RES. TRI. INST./NO1-ES6-2127
CHLOROWAX 40	63449-39-8	REPRODUCTIVE/DEVELOPMENTAL TOXICITY	C	
CHLOROWAX 500C	63449-39-8	REPRODUCTIVE/DEVELOPMENTAL TOXICITY	C	
CHRYSENE-TRANS-3,4-DIHYDRODIOL		PHARMACOKINETICS/METABOLISM	B	CARCINOGENESIS/EXP. 275/276
CHRYSENE-TRANS-3,4-DIHYDRODIOL		BIOCHEMICAL/CELLULAR/TISSUE EFFECTS	B	CARCINOGENESIS/EXP. 275/276
*1,8-CINEOLE	470-82-6	CHRONIC TOXICITY/CARCINOGENICITY	B	DIV. CHEM. TOXICOL./EXP. 380/389/439/440
*1,8-CINEOLE	470-82-6	PHARMACOKINETICS/METABOLISM	B	DIV. CHEMISTRY/EXP. 6034
*1,8-CINEOLE	470-82-6	CHRONIC TOXICITY/CARCINOGENICITY	A	DIV. CHEM. TOXICOL./EXP. 372
*1,8-CINEOLE	470-82-6	PHARMACOKINETICS/METABOLISM	D	DIV. CHEM. TOXICOL./EXP. 372
*CINNAMALDEHYDE	104-55-2	CHRONIC TOXICITY/CARCINOGENICITY	B	DIV. CHEM. TOXICOL./EXP. 381,390
*CINNAMALDEHYDE	104-55-2	PHARMACOKINETICS/METABOLISM	B	DIV. CHEMISTRY/EXP. 6055
CLOFIBRATE	637-07-0	ACUTE/CHRONIC TOXICITY	A	DIV. CHEM. TOXICOL.
CLOFIBRATE	637-07-0	BIOCHEMICAL/CELLULAR/TISSUE EFFECTS	A	DIV. CHEM. TOXICOL./EXP. 349/401/402/403
CLOFIBRATE	637-07-0	CARCINOGENESIS	D	DIV. CHEM. TOXICOL./EXP. 350
CLOFIBRATE	637-07-0	PHARMACOKINETICS/METABOLISM	A	DIV. CHEMISTRY/EXP. 349/401/402/403
CLOMIPHENE	911-45-5	REPRODUCTIVE/DEVELOPMENTAL TOXICITY	A	DIV. TERATOLOGY/EXP. 6044
CORTISOL	50-23-7	PHARMACOKINETICS/METABOLISM	B	DIV. TERATOLOGY/EXP. 6190
CYCLOPHOSPHAMIDE	50-18-0	SYSTEMIC/ORGAN TOXICITY	B	DIV. CARCINOGENESIS/EXP. 318
4-(DEOXYADENOSIN-6-YL)4-AMINOBIPHENYL		BIOCHEMICAL/CELLULAR/TISSUE EFFECTS	B	DIV. CARCINOGENESIS/EXP. 211/6187
4-(DEOXYADENOSIN-6-YL)-2-NAPHTHYLAMINE		BIOCHEMICAL/CELLULAR/TISSUE EFFECTS	B	DIV. CARCINOGENESIS/EXP. 211/6187
3-(DEOXYGUANOSINE-N2-YL)-2-ACETYLAMINOFLUORENE		BIOCHEMICAL/CELLULAR/TISSUE EFFECTS	B	DIV. CARCINOGENESIS/EXP. 211/6187
N-(DEOXYGUANOSINE-8-YL)-2-ACETYLAMINOFLUORENE		BIOCHEMICAL/CELLULAR/TISSUE EFFECTS	B	DIV. CARCINOGENESIS/EXP. 211/6187
N-(DEOXYGUANOSINE-8-YL)-4-AMINOBIPHENYL		BIOCHEMICAL/CELLULAR/TISSUE EFFECTS	B	DIV. CARCINOGENESIS/EXP. 211/6187
N-(DEOXYGUANOSINE-8-YL)-2-AMINOFLUORENE		BIOCHEMICAL/CELLULAR/TISSUE EFFECTS	B	DIV. CARCINOGENESIS/EXP. 211/6187
N-(DEOXYGUANOSINE-8-YL)-1-AMINOPYRENE		BIOCHEMICAL/CELLULAR/TISSUE EFFECTS	B	DIV. CARCINOGENESIS/EXP. 211/6187
3-DEUTERO-6-AMINOBENZO(A)PYRENE		MUTAGENESIS/GENETIC TOXICITY	B	DIV. CARCINOGENESIS/EXP. 6187
3-DEUTERO-6-AMINOBENZO(A)PYRENE		PHARMACOKINETICS/METABOLISM	B	DIV. CARCINOGENESIS/EXP. 275
3-DEUTERO-6-AMINOBENZO(A)PYRENE		MUTAGENESIS/GENETIC TOXICITY	B	DIV. CARCINOGENESIS/EXP. 275
3-DEUTERO-6-METHYLBENZO(A)PYRENE		CARCINOGENESIS	B	DIV. CARCINOGENESIS/EXP. 275
3-DEUTERO-6-METHYLBENZO(A)PYRENE		PHARMACOKINETICS/METABOLISM	B	DIV. CARCINOGENESIS/EXP. 275
3-DEUTERO-6-METHYLBENZO(A)PYRENE		MUTAGENESIS/GENETIC TOXICITY	B	DIV. CARCINOGENESIS/EXP. 275
		CARCINOGENESIS	B	DIV. CARCINOGENESIS/EXP. 275
1-DEUTERO-NAPHTHALENE		PHARMACOKINETICS/METABOLISM	A	DIV. MICROBIOLOGY/EXP. 6001

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TOXICOLOGY TESTING

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NATIONAL CENTER FOR TOXICOLOGICAL RESEARCH

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DEUTERO-6-NITROBENZO(A)PYRENE		PHARMACOKINETICS/METABOLISM	B	DIV. CARCINOGENESIS/EXP. 275
DEUTERO-6-NITROBENZO(A)PYRENE		MUTAGENESIS/GENETIC TOXICITY	B	DIV. CARCINOGENESIS/EXP. 275
DEUTERO-6-NITROBENZO(A)PYRENE		CARCINOGENESIS	B	DIV. CARCINOGENESIS/EXP. 275
DEXAMETHASONE	50-02-2	BIOCHEMICAL/CELLULAR/TISSUE EFFECTS	B	DIV. TERATOLOGY/EXP. 6065
DEXAMETHASONE	50-02-2	CARCINOGENESIS	B	DIV. TERATOLOGY/EXP. 6065
N,N-DIACETYL-4-AMINOBENZO(A)PYRENE	82507-24-2	PHARMACOKINETICS/METABOLISM	B	DIV. CARCINOGENESIS/EXP. 275
N,N-DIACETYL-4-AMINOBENZO(A)PYRENE	82507-24-2	MUTAGENESIS/GENETIC TOXICITY	B	DIV. CARCINOGENESIS/EXP. 275
N,N-DIACETYL-4-AMINOBENZO(A)PYRENE	82507-24-2	CARCINOGENESIS	B	DIV. CARCINOGENESIS/EXP. 275
DIBENZ(A)ANTHRACENE-TRANS-3,4--DIHYDRODIOL	66267-19-4	PHARMACOKINETICS/METABOLISM	B	DIV. CARCINOGENESIS/EXP. 275/276
DIBENZ(A)ANTHRACENE-TRANS-3,4--DIHYDRODIOL	66267-19-4	BIOCHEMICAL/CELLULAR/TISSUE EFFECTS	B	DIV. CARCINOGENESIS/EXP. 275/276
DIBROMOETHANE	106-93-4	MUTAGENESIS/GENETIC TOXICITY	A	DIV. MUTAGENESIS/EXP. 6314
1,3-DI((N-(4,6-DIMETHYL-2-PYRIMIDINYL)-4-SULFAMOYLPHENYL))-		MUTAGENESIS/GENETIC TOXICITY	B	DIV. CARCINOGENESIS/EXP 6149
DIETHYLSTILBESTROL	56-53-1	CHRONIC TOXICITY	A	DIV. CHEM. TOXICOL./EXP. 035/079/134
DIETHYLSTILBESTROL	56-53-1	BIOCHEMICAL/CELLULAR/TISSUE EFFECTS	B	DIV. TERATOLOGY/EXP. 170/6133
DIETHYLSTILBESTROL	56-53-1	PHARMACOKINETICS/METABOLISM	B	DIV. TERATOLOGY/EXP. 170/6133
DIMETHOXYBENZIDINE	119-90-4	ACUTE/CHRONIC TOXICITY	A	DIV. CHEM. TOXICOL./EXP. 088
N,N-DIMETHYL-4-AMINOBENZENE		PHARMACOKINETICS/METABOLISM	B	DIV.CARCINOGENESIS/EXP. 210
2-(DIMETHYLAMINOETHYLAMINO)PYRIDINE	23826-72-4	MUTAGENESIS/GENETIC TOXICITY	B	DIV. CARCINOGENESIS/EXP. 210
DIMETHYLBENZANTHRACENE	57-97-6	MUTAGENESIS/GENETIC TOXICITY	B	DIV. MUTAGENESIS/EXP. 275
DIMETHYLBENZANTHRACENE	57-97-6	CARCINOGENESIS	B	DIV. MUTAGENESIS/EXP. 275
DIMETHYLBENZANTHRACENE	57-97-6	CARCINOGENESIS	A	DIV. CHEM. TOXICOL./EXP. 247
7,12-DIMETHYLBENZ(A)ANTHRACENE	57-97-6	CARCINOGENESIS	A	DIV. CHEM. TOXICOL./EXP 247
3,3'-DIMETHYLBENZIDINE	119-93-7	CARCINOGENESIS	A	DIV. CHEM. TOXICOL./EXP. 090
DIMETHYLFORMAMIDE	68-12-2	REPRODUCTIVE/DEVELOPMENTAL TOXICITY	B	INVERESK RES. INT., LTD. NIOSH CONTRACT 2210-78-0026
N-(2,2-DIMETHYL-HYDROXYETHYL)--4-METHYLBENZAMIDE		PHARMACOKINETICS/METABOLISM	B	DIV. CHEMISTRY/EXP. 275
DIMETHYLNITROSAMINE	62-75-9	MUTAGENESIS/GENETIC TOXICITY	B	DIV. MUTAGENESIS/EXP. 160/6068
DINITROPYRENE		CARCINOGENESIS	B	DIV. CHEMISTRY/EXP. 6187
1,3-DINITROPYRENE	75321-20-9	MUTAGENESIS/GENETIC TOXICITY	B	DIV. OF CARCINOGENESIS/EXP. 6187

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192<

193<

TOXICOLOGY TESTING

FOOD AND DRUG ADMINISTRATION
NATIONAL CENTER FOR TOXICOLOGICAL RESEARCH

CHEMICAL	CAS NO.	TEST TYPE	STATUS	PERFORMING ORGANIZATION/PROJECT NO.
1,6-DINITROPYRENE	42397-64-8	MUTAGENESIS/GENETIC TOXICITY	B	DIV. OF CARCINOGENESIS/EXP. 6187
1,8-DINITROPYRENE	42397-65-9	MUTAGENESIS/GENETIC TOXICITY	B	DIV. OF CARCINOGENESIS/EXP. 6187
(3H)-1,3-DINITROPYRENE		MUTAGENESIS/GENETIC TOXICITY	B	DIV. OF CARCINOGENESIS/EXP. 6187
(3H)-1,6-DINITROPYRENE		MUTAGENESIS/GENETIC TOXICITY	B	DIV. OF CARCINOGENESIS/EXP. 6187
(3H)-1,8-DINITROPYRENE		MUTAGENESIS/GENETIC TOXICITY	B	DIV. OF CARCINOGENESIS/EXP. 6187
DIPHENYLHYDANTOIN	57-41-0	PHARMACOKINETICS/METABOLISM	B	DIV. CHEMISTRY/EXP. 272
DIPHENYLHYDANTOIN	57-41-0	IMMUNOLOGIC TOXICITY	A	DIV. OF CARCINOGENESIS/EXP. 272
DIPHENYLHYDANTOIN	57-41-0	CARCINOGENESIS	A	DIV. OF CARCINOGENESIS/EXP. 272
DIPHENYLHYDANTOIN	57-41-0	REPRODUCTIVE/DEVELOPMENTAL TOXICITY	A	DIV. OF CARCINOGENESIS/EXP. 272
DIRECT BLACK, BENZIDINE AND 3,3'-DICHLOROBENZIDINE	1937-37-7 92-87-5	ANALYTICAL CHEMISTRY	A	DIV. OF CHEMISTRY/EXP. 6250
DIRECT RED 2	992-59-6	ANALYTICAL CHEMISTRY	A	DIV. OF CHEMISTRY/EXP. 6117
1,3-DI(4-SULFAMOYLPHENYL)TRIAZINE		MUTAGENESIS/GENETIC TOXICITY	B	DIV. OF CHEM. TOXICOL./EXP. 6149
*DOXYLAMINE	469-21-6	PHARMACOKINETICS/METABOLISM	B	DIV. CHEMISTRY/EXP. 6039
*DOXYLAMINE	469-21-6	TERATOGENESIS/PHARMACOKINETICS/METABOLISM	A	DIV. OF TERATOGENESIS/EXP. 6126
*DOXYLAMINE (14-C)	469-21-6	PHARMACOKINETICS/METABOLISM	B	DIV. CHEMISTRY/EXP. 6262
*DOXYLAMINE	469-21-6	CARCINOGENESIS	B	DIV. CHEM. TOXICOL./EXP. 406/407
ESTRADIOL	50-28-2	CARCINOGENESIS	B	DIV. TERATOLOGY/EXP. 170
ESTRADIOL	50-28-2	BIOCHEMICAL/CELLULAR/TISSUE EFFECTS	B	DIV. TERATOLOGY/EXP. 170
ESTRADIOL	50-28-2	PHARMACOKINETICS/METABOLISM	B	DIV. TERATOLOGY/EXP. 170
ESTRADIOL	50-28-2	CHRONIC TOXICITY	A	DIV. CHEM. TOXICOL./EXP. 344
ESTRADIOL	50-28-2	PHARMACOKINETICS/METABOLISM	A	DIV. CHEM. TOXICOL./EXP. 6079
3-ETHYLADENINE	43003-87-8	BIOCHEMICAL/CELLULAR/TISSUE EFFECTS	B	DIV. CARCINOGENESIS/EXP. 318
7-ETHYLADENINE	24309-36-2	BIOCHEMICAL/CELLULAR/TISSUE EFFECTS	B	DIV. CARCINOGENESIS/EXP. 318
O2-ETHYLCYTOSINE		BIOCHEMICAL/CELLULAR/TISSUE EFFECTS	B	DIV. CARCINOGENESIS/EXP. 318
1-ETHYLDEOXYADENOSINE		BIOCHEMICAL/CELLULAR/TISSUE EFFECTS	B	DIV. CARCINOGENESIS/EXP. 318
N6-ETHYLDEOXYADENOSINE		BIOCHEMICAL/CELLULAR/TISSUE EFFECTS	B	DIV. CARCINOGENESIS/EXP. 318
3-ETHYLDEOXYCYTIDINE		BIOCHEMICAL/CELLULAR/TISSUE EFFECTS	B	DIV. CARCINOGENESIS/EXP. 318
N4-ETHYLDEOXYCYTIDINE		BIOCHEMICAL/CELLULAR/TISSUE EFFECTS	B	DIV. CARCINOGENESIS/EXP. 318
1-ETHYLDEOXYGUANOSINE		BIOCHEMICAL/CELLULAR/TISSUE EFFECTS	B	DIV. CARCINOGENESIS/EXP. 318
N2-ETHYLDEOXYGUANOSINE		BIOCHEMICAL/CELLULAR/TISSUE EFFECTS	B	DIV. CARCINOGENESIS/EXP. 318
O6-ETHYLDEOXYGUANOSINE		BIOCHEMICAL/CELLULAR/TISSUE EFFECTS	B	DIV. CARCINOGENESIS/EXP. 318
3-ETHYLGUANINE	55146-01-5	BIOCHEMICAL/CELLULAR/TISSUE EFFECTS	B	DIV. CARCINOGENESIS/EXP. 318
7-ETHYLGUANINE	19530-88-2	BIOCHEMICAL/CELLULAR/TISSUE EFFECTS	B	DIV. CARCINOGENESIS/EXP. 318
ETHYL METHANESULFONATE	62-50-0	BIOCHEMICAL/CELLULAR/TISSUE EFFECTS	B	DIV. CARCINOGENESIS/EXP. 318
ETHYL METHANESULFONATE	65-50-0	MUTAGENESIS/GENETIC TOXICITY	B	DIV. MUTAGENESIS/EXP. 318
ETHYL METHANESULFONATE	62-50-0	CARCINOGENESIS	B	DIV. MUTAGENESIS/EXP. 318
ETHYLNITROSOUREA	759-73-9	BIOCHEMICAL/CELLULAR/TISSUE EFFECTS	B	DIV. CARCINOGENESIS/EXP. 318
4-ETHYLSULFONYLNAPHTHALENE-1-SULFONAMIDE	842-00-2	BIOCHEMICAL/CELLULAR/TISSUE EFFECTS	B	DIV. CARCINOGENESIS/EXP. 318
3-ETHYLTHYMIDINE	21473-40-5	BIOCHEMICAL/CELLULAR/TISSUE EFFECTS	B	DIV. CARCINOGENESIS/EXP. 318

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TOXICOLOGY TESTING

FOOD AND DRUG ADMINISTRATION
NATIONAL CENTER FOR TOXICOLOGICAL RESEARCH

CHEMICAL	CAS NO.	TEST TYPE	STATUS	PERFORMING ORGANIZATION/PROJECT NO.
02-ETHYLTHYMIDINE	59495-21-5	BIOCHEMICAL/CELLULAR/TISSUE EFFECTS	B	DIV. CARCINOGENESIS/EXP. 318
04-ETHYLTHYMIDINE		BIOCHEMICAL/CELLULAR/TISSUE EFFECTS	B	DIV. CARCINOGENESIS/EXP. 318
ETHYLTHMIDYL(3'-5')DEOXYADENOSINE		BIOCHEMICAL/CELLULAR/TISSUE EFFECTS	B	DIV. CARCINOGENESIS/EXP. 318
ETHYLTHYMIDYL(3'-5')DEOXYCYTIDINE		BIOCHEMICAL/CELLULAR/TISSUE EFFECTS	B	DIV. CARCINOGENESIS/EXP. 318
7-FLUROBENZANTHRACENE-TRANS--5,6-DIHYDRODIOL			B	DIVISION OF CARCINOGENESIS/EXP. 276
8-(N-FLUOREN-2-YLACETAMIDO)-2'-DEOXYGUANOSINE 5'-MONOPHOSPHATE	14490-86-9	BIOCHEMICAL/CELLULAR/TISSUE EFFECTS	A	DIV. CHEMISTRY/EXP. 6012
8-(N-FLUOREN-2-YLAMINO)-2'-DEOXYGUANOSINE 5'-MONOPHOSPHATE	17660-46-7	BIOCHEMICAL/CELLULAR/TISSUE EFFECTS	A	DIV. CHEMISTRY/EXP. 6012
5-FORMYLBENZ(A)ANTHRACENE		PHARMACOKINETICS/METABOLISM	B	DIV. CARCINOGENESIS/EXP. 275/276
6-FORMYLBENZ(A)ANTHRACENE		PHARMACOKINETICS/METABOLISM	B	DIV. CARCINOGENESIS/EXP. 275/276
8-FORMYLBENZ(A)ANTHRACENE	72533-46-1	PHARMACOKINETICS/METABOLISM	B	DIV. CARCINOGENESIS/EXP. 275/276
12-FORMYLBENZ(A)ANTHRACENE	3558-03-0	PHARMACOKINETICS/METABOLISM	B	DIV. CARCINOGENESIS/EXP. 275/276
7-FORMYLBENZ(A)ANTHRACENE	7505-62-6	PHARMACOKINETICS/METABOLISM	B	DIV. CARCINOGENESIS/EXP. 275/276
N-FORMYL-N-HYDROXY-2-AMINOFLUORENE	67176-33-4	BIOCHEMICAL/CELLULAR/TISSUE EFFECTS	B	DIV. CHEM. TOXICOL./EXP. 186/6124/6125
GENTIAN VIOLET	548-62-9	ACUTE/CHRONIC TOXICITY	A	DIV. CHEM. TOXICOL. EXP 278/279/304/338/354/355
GENTIAN VIOLET	548-62-9	CARCINOGENESIS	A	DIV. CARCINOGENESIS/CHEM TOX. EXP. 283/264/360/361/362/6121
GENTIAN VIOLET	548-62-9	PHARMACOKINETICS/METABOLISM	A	DIV. CHEM. TOXICOL./EXP. 259/302/303/6040
N-(GUANOSINE-8-YL)-4-AMINOBIPHENYL		PHARMACOKINETICS/METABOLISM	B	DIV. CARCINOGENESIS/EXP. 211
HC-BLUE-NO. 1	2784-94-3	MUTAGENESIS/GENETIC TOXICITY	A	DIV. MUTAGENESIS RES./EXP. 6097
N-HYDROXYACETAMINOPHEN	63975-21-3	PHARMACOKINETICS/METABOLISM	B	DIV. CARCINOGENESIS/EXP. 6098
N-HYDROXY-2-ACETYLAMINOFLUORENE	53-95-2	BIOCHEMICAL/CELLULAR/TISSUE EFFECTS	B	DIV. CARCINOGENESIS/EXP. 6029/159
N-HYDROXY-2-ACETYLAMINOFLUORENE	53-95-2	BIOCHEMICAL/CELLULAR/TISSUE EFFECTS	A	DIV. CHEM. TOXICOL./EXP. 6124/6125
N-HYDROXY-N-ACETYL-2-AMINOFLUORENE	30651-40-2	BIOCHEMICAL/CELLULAR/TISSUE EFFECTS	A	DIV. CARCINOGENESIS/EXP. 211
N-HYDROXY-N-ACETYL-2-AMINOFLUORENE		CARCINOGENESIS	A	DIV. CHEM. TOXICOL./EXP. 186
N-HYDROXY-1-ACETYLAMINOPYRENE		PHARMACOKINETICS/METABOLISM	B	DIV. CHEMISTRY/EXP. 6182

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194<

195<

TOXICOLOGY TESTING

FOOD AND DRUG ADMINISTRATION
NATIONAL CENTER FOR TOXICOLOGICAL RESEARCH

CHEMICAL	CAS NO.	TEST TYPE	STATUS	PERFORMING ORGANIZATION/PROJECT NO.
				DIV. CARCINOGENESIS/EXP. 6187
N-HYDROXY-N-ACETYLBENZIDINE	71609-25-1	CARCINOGENESIS	B	DIV. CARCINOGENESIS/EXP. 211
N'-HYDROXY-N-ACETYLBENZIDINE	71609-23-9	CARCINOGENESIS	B	DIV. CARCINOGENESIS/EXP. 211
N-HYDROXY-4-AMINOBIPHENYL	6810-26-0	CARCINOGENESIS	B	DIV. CARCINOGENESIS/EXP. 211
N-HYDROXY-AMINOFLUORENE	53-94-1	MUTAGENESIS/GENETIC TOXICITY	B	DIV. MUTAGENESIS/EXP. 160
N-HYDROXY-AMINOFLUORENE	53-94-1	CARCINOGENESIS	B	DIV. MUTAGENESIS/EXP. 160
N-HYDROXY-2-AMINOFLUORENE	53-94-1	BIOCHEMICAL/CELLULAR/TISSUE EFFECTS	B	DIV. CARCINOGENESIS/EXP. 211
N-HYDROXY-1-AMINOPYRENE		BIOCHEMICAL/TISSUE/CELLULAR EFFECTS	B	DIV. CARCINOGENESIS/EXP. 6121/6187
N-HYDROXY-N-FORMYL-2-AMINOFLUORENE		CARCINOGENESIS	A	DIV. CARCINOGENESIS/EXP. 186
1-HYDROXYMETHYLBENZ(A)ANTHRACENE		PHARMACOKINETICS/METABOLISM	B	DIV. CARCINOGENESIS/EXP. 275/276
12-HYDROXYMETHYLBENZ(A)ANTHRACENE	13345-63-6	PHARMACOKINETICS/METABOLISM	B	DIV. CARCINOGENESIS/EXP. 275/276
7-HYDROXYMETHYLBENZ(A)ANTHRACENE	16110-13-7	PHARMACOKINETICS/METABOLISM	B	DIV. CARCINOGENESIS/EXP. 275/276
6-HYDROXYMETHYLBENZ(A)PYRENE	21247-98-3	PHARMACOKINETICS/METABOLISM	B	DIV. CARCINOGENESIS/EXP. 275/276
N-HYDROXY-1-NAPHTHYLAMINE	607-30-7	CARCINOGENESIS	B	DIV. CARCINOGENESIS EXP. 283/264/360/361/362/363
N-HYDROXY-1-NAPHTHYLAMINE	607-30-7	CARCINOGENESIS	B	DIV. CARCINOGENESIS/EXP. 211
N-HYDROXY-2-NAPHTHYLAMINE	613-47-8	CARCINOGENESIS	B	DIV. CARCINOGENESIS EXP. 283/264/360/361/362/363
N-HYDROXY-2-NAPHTHYLAMINE	613-47-8	CARCINOGENESIS	B	DIV. CARCINOGENESIS/EXP. 211
N-HYDROXY-2-NAPHTHYLAMINE	613-47-8	BIOCHEMICAL/CELLULAR/TISSUE EFFECTS	B	DIV. CARCINOGENESIS/EXP. 157/159
(3H)-N-HYDROXY-1-NAPHTHYLAMINE		SYSTEMIC/ORGAN TOXICITY	B	DIV. CARINOGENESIS/EXP. 211/387
(3H)N-HYDROXY-2-NAPHTHYLAMINE		SYSTEMIC/ORGAN TOXICITY	B	DIV. CARCINOGENESIS/EXP. 211/387
N-HYDROXYPHENACETIN	19315-64-1	PHARMACOKINETICS/METABOLISM MUTAGENESIS/GENETIC TOXICITY	B	DIV. CARCINOGENESIS/EXP. 6098
N-HYDROXY-P-PHENETIDINE	19315-64-1	PHARMACOKINETICS/METABOLISM MUTAGENESIS/GENETIC TOXICITY	B	DIV. CARCINOGENESIS/EXP. 6098
N-HYDROXY-N-PROPIONYL-2-AMINOFLUORENE		CARCINOGENESIS/BIOCHEMICAL CELL AND TISSUE EFFECTS	A	DIV. CHEM. TOXICOL./EXP. 186
ISOPROPYL METHYLPHOSPHOROFLUORIDATE		REPRODUCTIVE/DEVELOPMENTAL TOXICITY	A	DIV. TERATOLOGY/EXP. 6164/6165
LINDANE	58-89-9	IMMUNOLOGIC TOXICITY	C	DIV. CARCINOGENESIS/EXP. 189
LINDANE	58-89-9	IMMUNOLOGIC TOXICITY	A	DIV. CARCINOGENESIS/EXP. 189
LINDANE	58-89-9	ACUTE/CHRONIC TOXICITY	A	DIV. CHEM. TOXICOL./EXP. 228
LINDANE	58-89-9	BIOCHEMICAL/CELLULAR/TISSUE EFFECTS	A	DIV. CHEM. TOXICOL./EXP. 192
*METHAPYRILENE	91-80-5	CARCINOGENESIS	B	DIV. CHEM. TOXICOL./NTP/ EXP. 357/358/373/375/382/383
2-(P-METHOXYBENZYLAMINO)-PYRIDINE		MUTAGENESIS/GENETIC TOXICITY	B	DIV. CARCINOGENESIS
3-METHYLADENINE	5142-23-4	MUTAGENESIS/GENETIC TOXICITY	B	DIV. CARCINOGENESIS/EXP. 318

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TOXICOLOGY TESTING

FOOD AND DRUG ADMINISTRATION
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CHEMICAL	CAS NO.	TEST TYPE	STATUS	PERFORMING ORGANIZATION/PROJECT NO.
7-METHYLADENINE	935-69-3	MUTAGENESIS/GENETIC TOXICITY	B	DIV. CARCINOGENESIS/EXP. 318
N-METHYL-4-AMINOAZOBENZENE	621-90-9	CARCINOGENESIS	B	DIV. CARCINOGENESIS/EXP. 360/362
N-METHYLANILINE	100-61-8	PHARMACOKINETICS/METABOLISM		DIV. CHEMISTRY/EXP. 6005
1-METHYLBENZ(A)ANTHRACENE	2498-77-3	PHARMACOKINETICS/METABOLISM	B	DIV. CARCINOGENESIS/EXP. 275/276
1-METHYLBENZ(A)ANTHRACENE	2498-77-3	MUTAGENESIS/GENETIC TOXICITY	B	DIV. CARCINOGENESIS/EXP. 275/276
1-METHYLBENZ(A)ANTHRACENE	2498-77-3	CARCINOGENESIS	B	DIV. CARCINOGENESIS/EXP. 275/276
10-METHYLBENZ(A)ANTHRACENE	2381-15-9	CARCINOGENESIS	B	DIV. CARCINOGENESIS/EXP. 275/276
11-METHYLBENZ(A)ANTHRACENE	6111-78-0	CARCINOGENESIS	B	DIV. CARCINOGENESIS/EXP. 275/276
12-METHYLBENZ(A)ANTHRACENE	2422-79-9	CARCINOGENESIS	B	DIV. CARCINOGENESIS/EXP. 275/276
2-METHYLBENZ(A)ANTHRACENE	2498-76-2	CARCINOGENESIS	B	DIV. CARCINOGENESIS/EXP. 275/276
3-METHYLBENZ(A)ANTHRACENE	2498-75-1	CARCINOGENESIS	B	DIV. CARCINOGENESIS/EXP. 275/276
4-METHYLBENZ(A)ANTHRACENE	316-49-4	CARCINOGENESIS	B	DIV. CARCINOGENESIS/EXP. 275/276
5-METHYLBENZ(A)ANTHRACENE	2319-96-2	CARCINOGENESIS	B	DIV. CARCINOGENESIS/EXP. 275/276
6-METHYLBENZ(A)ANTHRACENE	316-14-3	CARCINOGENESIS	B	DIV. CARCINOGENESIS/EXP. 275/276
7-METHYLBENZ(A)ANTHRACENE	2541-69-7	CARCINOGENESIS	B	DIV. CARCINOGENESIS/EXP. 275/276
8-METHYLBENZ(A)ANTHRACENE	2381-31-9	CARCINOGENESIS	B	DIV. CARCINOGENESIS/EXP. 275/276
9-METHYLBENZ(A)ANTHRACENE	2381-16-0	CARCINOGENESIS	B	DIV. CARCINOGENESIS/EXP. 275/276
12-METHYLBENZ(A)ANTHRACENE-TRANS-DIHYDRODIOL		PHARMACOKINETICS/METABOLISM	B	DIV. CARCINOGENESIS/EXP. 275/276
7-METHYLBENZ(A)ANTHRACENE-TRANS-5,6-DIHYDRODIOL		PHARMACOKINETICS/METABOLISM	B	DIV. CARCINOGENESIS/EXP. 275/276
10-METHYLBENZO(A)PYRENE	63104-32-5	PHARMACOKINETICS/METABOLISM	B	DVI. CARCINOGENESIS/EXP. 275/276
10-METHYLBENZO(A)PYRENE	63104-32-5	MUTAGENESIS/GENETIC TOXICITY	B	DIV. CARCINOGENESIS/EXP. 275/276
10-METHYLBENZO(A)PYRENE	63104-32-5	CARCINOGENESIS	B	DIV. CARCINOGENESIS/EXP. 275/276
6-METHYLBENZO(A)PYRENE	2381-39-7	PHARMACOKINETICS/METABOLISM	B	DIV. CARCINOGENESIS/EXP. 275/276
6-METHYLBENZO(A)PYRENE	2381-39-7	MUTAGENESIS/GENETIC TOXICITY	B	DIV. CARCINOGENESIS/EXP. 275/276
6-METHYLBENZO(A)PYRENE	2381-39-7	CARCINOGENESIS	B	DIV. CARCINOGENESIS/EXP. 275/276
7-METHYLBENZO(A)PYRENE	63041-77-0	PHARMACOKINETICS/METABOLISM	B	DIV. CARCINOGENESIS/EXP. 275/276
7-METHYLBENZO(A)PYRENE	63041-77-0	MUTAGENESIS/GENETIC TOXICITY	B	DIV. CARCINOGENESIS/EXP. 275/276
8-METHYLBENZO(A)PYRENE	63041-76-9	PHARMACOKINETICS/METABOLISM	B	DIV. CARCINOGENESIS/EXP. 275/276
8-METHYLBENZO(A)PYRENE	63041-76-9	CARCINOGENESIS	B	DIV. CARCINOGENESIS/EXP. 275/276
7-METHYLBENZO(A)PYRENE-TRANS-7-,8-DIHYDRODIOL		BIOCHEMICAL/CELLULAR/TISSUE EFFECTS PHARMACOKINETICS/METABOLISM	B	DIV. CARCINOGENESIS/EXP. 275/276
7-METHYLBENZO(A)PYRENE-TRANS-7-,8-DIHYDRODIOL-ANTI-9,10-EPOXIDE		BIOCHEMICAL/CELLULAR/TISSUE EFFECTS PHARMACOKINETICS/METABOLISM	B	DIV. CARCINOGENESIS/EXP. 275/276

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NATIONAL CENTER FOR TOXICOLOGICAL RESEARCH

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7-METHYLBENZ(A)PYRENE	63041-77-0	CARCINOGENESIS	B	DIV. CARCINOGENESIS/EXP. 275/276
O2-METHYLCYTOSINE		PHARMACOKINETICS/METABOLISM	A	DIV. CARCINOGENESIS/EXP. 318
1-METHYLDEOXYADENOSINE		PHARMACOKINETICS/METABOLISM	A	DIV. CARCINOGENESIS/EXP. 318
N6-METHYLDEOXYADENOSINE		PHARMACOKINETICS/METABOLISM	A	DIV. CARCINOGENESIS/EXP. 318
3-METHYLDEOXYCYTIDINE		PHARMACOKINETICS/METABOLISM	A	DIV. CARCINOGENESIS/EXP. 318
N4-METHYLDEOXYCYTIDINE		PHARMACOKINETICS/METABOLISM	A	DIV. CARCINOGENESIS/EXP. 318
1-METHYLDEOXYGUANOSINE		PHARMACOKINETICS/METABOLISM	A	DIV. CARCINOGENESIS/EXP. 318
O6-METHYLDEOXYGUANOSINE		PHARMACOKINETICS/METABOLISM	A	DIV. CARCINOGENESIS/EXP. 318
3-METHYLGUANINE	2958-98-7	PHARMACOKINETICS/METABOLISM	A	DIV. CARCINOGENESIS/EXP. 318
3-METHYLGUANINE	2958-98-7	PHARMACOKINETICS/METABOLISM	A	DIV. CARCINOGENESIS/EXP. 318
7-METHYLGUANINE	578-76-7	PHARMACOKINETICS/METABOLISM	A	DIV. CARCINOGENESIS/EXP. 318
METHYL MERCURIC CHLORIDE	115-09-3	NEUROLOGIC/BEHAVIORAL TOXICITY	C	NCTR/NIOSH CONTRACTS:U. OF MISS. 22-81-2
METHYL MERCURY	22967-92-6	NEUROLOGIC/BEHAVIORAL TOXICITY	A	DIV. TERATOLOGY/EXP. 255/285
METHYL MERCURY	22967-92-6	REPRODUCTIVE/DEVELOPMENTAL TOXICITY	A	DIV. TERATOLOGY/EXP. 255/285
METHYL METHANESULFONATE	66-27-3	MUTAGENESIS/GENETIC TOXICITY	B	DIV. MUTAGENESIS/EXP. 160/604
METHYL METHANESULFONATE	66-27-3	CARCINOGENESIS	B	DIV. MUTAGENESIS/EXP. 160/604
METHYL METHANESULFONATE	66-27-3	BIOCHEMICAL/CELLULAR/TISSUE EFFECTS	B	DIV. CARCINOGENESIS/EXP. 160
N-METHYL-N-NITROSOUREA	684-93-5	CARCINOGENESIS	B	DIV. CARCINOGENESIS EXP. 318
N-METHYLSULFAMETHAZINE		PHARMACOKINETICS/METABOLISM	B	DIV. CHEMISTRY/EXP. 6005
3-METHYLTHYMIDINE	958-74-7	PHARMACOKINETICS/METABOLISM	A	DIV. CARCINOGENESIS/EXP. 318
O2-METHYLTHYMIDINE		PHARMACOKINETICS/METABOLISM	A	DIV. CARCINOGENESIS/EXP. 318
O4-METHYLTHYMIDINE		PHARMACOKINETICS/METABOLISM	A	DIV. CARCINOGENESIS/EXP. 318
METHYLTHYMIDYLYL(3'-5')DEOXYADENOSINE		PHARMACOKINETICS/METABOLISM	A	DIV. CARCINOGENESIS/EXP. 318
METHYLTHYMIDYLYL(3'-5')DEOXYCYTIDINE		PHARMACOKINETICS/METABOLISM	A	DIV. CARCINOGENESIS/EXP. 318
METHYLTHYMIDYLYL(3'-5')THYMIDINE		PHARMACOKINETICS/METABOLISM	A	DIV. CARCINOGENESIS/EXP. 318
MOXESTROL	38416-55-2	BIOCHEMICAL/CELLULAR/TISSUE EFFECTS	A	DIV. CARCINOGENESIS/EXP. 6029/159
1-NAPHTHYLAMINE	134-32-7	PHARMACOKINETICS/METABOLISM	A	DIV. TERATOLOGY/EXP. 170
2-NAPHTHYLAMINE	91-59-8	CARCINOGENESIS	B	DIV. CARCINOGENESIS RES./EXP. 211
(3H)1-NAPHTHYLAMINE		SYSTEMIC/ORGAN TOXICITY	B	DIV. CARCINOGENESIS/EXP. 211
(3H)2-NAPHTHYLAMINE		SYSTEMIC/ORGAN TOXICITY	B	DIV. CARCINOGENESIS/EXP. 211/387
1,2-NAPTHALENEDIHYDRODIOL	7234-04-0		B	DIV. CARCINOGENESIS/EXP. 211/387
NITROBENZO(A)PYRENE		PHARMACOKINETICS/METABOLISM	B	DIV. CARCINOGENESIS/EXP. 276
1-NITROBENZO(A)PYRENE	70021-99-7	PHARMACOKINETICS/METABOLISM	B	DIV. CHEMISTRY/EXP. 275
6-NITROBENZO(A)PYRENE	63041-90-7	PHARMACOKINETICS/METABOLISM	B	DIV. CHEMISTRY/EXP. 276
6-NITROBENZO(A)PYRENE	63041-90-7	MUTAGENESIS/GENETIC TOXICITY	B	DIV. CARCINOGENESIS/EXP. 275/276
6-NITROBENZO(A)PYRENE	63041-90-7	CARCINOGENESIS	B	DIV. CARCINOGENESIS/EXP. 275/276
(3H)4-NITROBIPHENYL		SYSTEMIC/ORGAN TOXICITY	B	DIV. CARCINOGENESIS/EXP. 275/276
4-NITROBIPHENYL	92-93-3	CARCINOGENESIS	B	DIV. CARCINOGENESIS/EXP. 211/387
2-NITROFLUORENE	607-57-8	CARCINOGENESIS	B	DIV. CARCINOGENESIS/EXP. 211
1-NITRONAPHTHALENE	86-57-7	CARCINOGENESIS	B	DIV. CARCINOGENESIS/EXP. 211

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P-NITROPHENOL	100-02-7	ACUTE/CHRONIC TOXICITY	A	PATHOLOGY(CONTRACT)/EXP. 5062
4-NITROPHENYLHYDROXYLAMINE	16169-16-7	PHARMACOKINETICS/METABOLISM	B	DIV. CARCINOGENESIS
1-NITROPYRENE	5522-43-0	MUTAGENESIS/GENETIC TOXICITY	B	DIV. CARCINOGENESIS/EXP. 6191/6187
1-NITROPYRENE	5522-43-0	ANALYTICAL CHEMISTRY	A	DIV. CHEMISTRY/EXP. 6234
(3H)-1-NITROPYRENE		MUTAGENESIS/GENETIC TOXICITY	B	DIV. OF CARCINOGENESIS/EXP. 6191/6187
1-NITROPYRENE-CIS-4,5-DIHYDRODIOL		PHARMACOKINETICS/METABOLISM	B	DIV. CARCINOGENESIS/EXP. 6187
1-NITROPYRENE-TRANS-4,5-DIHYDRODIOL		PHARMACOKINETICS/METABOLISM	B	DIV. CARCINOGENESIS/EXP. 6187
3-NITROPYRENOL		PHARMACOKINETICS/METABOLISM	B	DIV. CARCINOGENESIS/EXP. 6187
4-NITROPYRENOL		PHARMACOKINETICS/METABOLISM	B	DIV. CARCINOGENESIS/EXP. 6187
5-NITROPYRENOL		PHARMACOKINETICS/METABOLISM	B	DIV. CARCINOGENESIS/EXP. 6187
6-NITROPYRENOL		PHARMACOKINETICS/METABOLISM	B	DIV. CARCINOGENESIS/EXP. 6187
8-NITROPYRENOL		PHARMACOKINETICS/METABOLISM	B	DIV. CARCINOGENESIS/EXP. 6187
9-NITROPYRENOL		PHARMACOKINETICS/METABOLISM	B	DIV. CARCINOGENESIS/EXP. 6187
10-NITROPYRENOL		PHARMACOKINETICS/METABOLISM	B	DIV. CARCINOGENESIS/EXP. 6187
NITROSAMINE IN PACIFIERS: COMPLIANCE TESTING		ANALYTICAL CHEMISTRY	B	DIV. CHEMISTRY/EXP. 6210 CPSC/NCTR IAG 224-82-0007 MOD. 2
NITROSAMINES IN PACIFIERS: COLLABORATION OF NCTR METHOD THROUGH AOAC		ANALYTICAL CHEMISTRY	A	DIV. CHEMISTRY/EXP. 6304
4'-NITROSO-N-ACETYL-4-AMINOBIPHENYL		CARCINOGENESIS	B	DIV. CARCINOGENESIS/EXP. 159
4-NITROSOBIPHENYL	10125-76-5	CARCINOGENESIS		DIV. CARINOGENESIS/EXP. 159
1-NITROSONAPHTHALENE	21711-65-9	CARCINOGENESIS	B	DIV. CARCINOGENESIS/EXP. 159
P-NITROSOPHENETOLE	3420-97-1	PHARMACOKINETICS/METABOLISM	B	DIV. CARCINOGENESIS/EXP. 6098
1-NITROSOPYRENE		MUTAGENESIS/GENETIC TOXICITY	B	DIV. CARCINOGENESIS/EXP. 6187
OXAMIDE	471-46-5	SYSTEMIC/ORGAN TOXICITY	B	DIV. CARCINOGENESIS/EXP. 318
PARAOXON	311-45-5	BIOCHEMICAL/CELLULAR/TISSUE EFFECTS	B	DIV. CARCINOGENESIS/EXP. 6094
PARAOXON	311-45-5	BIOCHEMICAL/CELLULAR/TISSUE EFFECTS	A	DIV. CHEM. TOXICOL./EXP. 6124/6125/186
PENICILLAMINE HYDROCHLORIDE	2219-30-9	CHEMISTRY METHODS	A	DIV. CHEMISTRY/EXP. 6283
PENTAMETHYLPARAROSANILINE	603-47-4	PHARMACOKINETICS/METABOLISM	B	DIV. CARCINOGENESIS/EXP. 259
PENTAMETHYLPARAROSANILINE	603-47-4	MUTAGENESIS/GENETIC TOXICITY	B	DIV. CARCINOGENESIS/EXP. 259
PHENACETIN-D2		PHARMACOKINETICS/METABOLISM		DIV. CARCINOGENESIS/EXP. 6098
PHENOBARBITAL	50-06-6	CARCINOGENESIS	B	ASSOC DIR. RESEARCH/EXP. 246
PHENOBARBITAL	50-06-6	PHARMACOKINETICS/METABOLISM	A	DIV. CHEMISTRY/DIV. CARCINOGENESIS EXP. 246/6187

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199<

TOXICOLOGY TESTING

FOOD AND DRUG ADMINISTRATION
NATIONAL CENTER FOR TOXICOLOGICAL RESEARCH

CHEMICAL	CAS NO.	TEST TYPE	STATUS	PERFORMING ORGANIZATION/PROJECT NO.
3'-PHOSPHOADENOSINE-5'-PHOSPHOSULFATE		PHARMACOKINETICS/METABOLISM	B	DIV. CARCINOGENESIS/EXP. 6094
POLYMETHYL SILOXANE		TERATOLOGY	A	DIV. TERATOLOGY/EXP. 6291
PROGESTERONE	57-83-0	PHARMACOKINETICS/METABOLISM	A	DIV. TERATOLOGY/EXP. 6065
N-PROPIONYL-N-HYDROXY-2-AMINOFLUORENE	52663-84-0	DNA BINDING/METABOLISM		DIV. CARCINOGENESIS/EXP. 6124/6125
PYRENE		PHARMACOKINETICS/METABOLISM	B	DIV. CARCINOGENESIS/EXP. 6187
*PYRENEQUINONE	39461-53-5	PHARMACOKINETICS/METABOLISM	B	DIV. CHEMISTRY/EXP. 276
*PYRILAMINE	91-84-9	PHARMACOKINETICS/METABOLISM	B	DIV. CHEM. TOXICOL./EXP. 6039
*PYRILAMINE	91-84-9	CHRONIC TOXICITY/CARCINOGENESIS	C	DIV. CHEM. TOXICOL. EXP. 408/409
*PYRILAMINE	91-84-9	MUTAGENESIS/GENETIC TOXICITY	A	DIV. MUTAGENESIS
PYRILAMINE	91-84-9	PHARMACOKINETICS/METABOLISM	A	DIV. CHEMISTRY/EXP. 6039
RESERPINE	50-55-5	BEHAVIOR/TERATOLOGY	A	DIV. TERATOLOGY/EXP. 6309/6315/6319
RETINOIC ACID	302-79-4	BEHAVIOR/TERATOLOGY	A	DIV. TERATOLOGY/EXP. 6320
SACCHARIN	81-07-2	ACUTE/CHRONIC TOXICITY	B	DIV. CARCINOGENESIS/EXP. 258/318
SACCHARIN	81-07-2	BIOCHEMICAL/CELLULAR/TISSUE EFFECTS	B	DIV. CARCINOGENESIS/EXP. 6094/6091
SACCHARIN	81-07-2	BIOCHEMICAL/CELLULAR/TISSUE EFFECTS	B	DIV. CARCINOGENESIS/EXP. 6229
SODIUM SALICYLATE	54-21-7	REPRODUCTIVE/DEVELOPMENTAL TOXICITY	B	DIV. TERATOGENESIS RES./EXP 156/190/6163
SODIUM SALICYLATE	54-21-7	PHARMACOKINETICS/METABOLISM	B	DIV. TERATOLOGY/EXP. 156/190/6163
SODIUM SALICYLATE	54-21-7	REPRODUCTIVE/DEVELOPMENTAL TOXICITY	B	DIV. TERATOLOGY/EXP. 156/190
SULFAMETHAZINE	57-68-1	CHRONIC TOXICITY PHARMACOKINETICS/METABOLISM REPRODUCTIVE/DEVELOPMENTAL TOXICITY	A	DIV. CHEMICAL TOX. EXP 418/419/333/334/420/421/422/423
SULFAMETHAZINE	57-68-1	CARCINOGENESIS	B	DIV. CHEMICAL TOX. EXP. 283/264/360/361/362/363
SULFAMETHAZINE	57-68-1	ACUTE/CHRONIC TOXICITY	B	DIV. CHEM. TOXICOL./EXP. 418/419
SULFAMETHAZINE	57-68-1	CARCINOGENESIS	B	DIV. CHEM. TOXICOL./EXP. 418/419
SULFAMETHAZINE	57-68-1	PHARMACOKINETICS/METABOLISM	B	DIV. CHEM. TOXICOL./EXP. 6005/347/348
SULFAMETHAZINE	57-68-1	PHARMACOKINETICS/METABOLISM	A	DIV. CHEMISTRY/EXP. 6005
SULFAMETHAZINE-N4-GLUCOSIDE		PHARMACOKINETICS/METABOLISM	B	DIV. CHEM. TOXICOL./EXP. 6005/347/348
SULFAMETHAZINE-N4-GLUCURONIDE		PHARMACOKINETICS/METABOLISM	B	DIV. CHEM. TOXICOL./EXP. 6005/347/348
SULFAMETHAZINE TRIAZENE		MUTAGENESIS/GENETIC TOXICITY	B	DIV. CHEM. TOXICOL./EXP. 6149
TESTOSTERONE	58-22-0	BIOCHEMICAL/CELLULAR/TISSUE EFFECTS	A	DIV. TERATOLOGY/EXP. 6065
TETRAHYDROBENZO(A)PYRENE			B	DIV. CHEMISTRY/EXP. 276
N,N,N',N'-TETRAMETHYLPARAROSANILINE		MUTAGENESIS/GENETIC TOXICITY	B	DIV. CARCINOGENESIS/EXP. 259
THENYLDIAMINE	91-79-2	ACUTE/CHRONIC TOXICITY	B	OSI/EXP. 414/415

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TOXICOLOGY TESTING

FOOD AND DRUG ADMINISTRATION
CENTER FOR DRUGS AND BIOLOGICS

CHEMICAL	CAS NO.	TEST TYPE	STATUS	PERFORMING ORGANIZATION/PROJECT NO.
ACEBUTOLOL	37517-30-9	IMMUNOLOGIC TOXICITY		
		SUBCHRONIC TOXICITY	B	DIVISION OF DRUG BIOLOGY/NDE-R-24
AMIODARONE	1951-25-3	SYSTEMIC/ORGAN TOXICITY		
		SUBCHRONIC TOXICITY	B	DIVISION OF DRUG BIOLOGY/NDE-R-15
AMPHETAMINE	300-62-9	SYSTEMIC/ORGAN TOXICITY		
		SUBCHRONIC TOXICITY	B	DIVISION OF DRUG BIOLOGY/NDE-R-4
BENZYL ALCOHOL	100-51-6	SYSTEMIC/ORGAN TOXICITY		
		SUBCHRONIC TOXICITY	B	DIVISION OF DRUG BIOLOGY
BITOLTEROL	30392-41-7	SYSTEMIC/ORGAN TOXICITY		
		SUBCHRONIC TOXICITY	A	DIVISION OF DRUG BIOLOGY/NDE-R-36
BISACODYL	603-50-9	SYSTEMIC/ORGAN TOXICITY		
		SUBCHRONIC TOXICITY	A	DIVISION OF DRUG BIOLOGY/NDE-R-40
DAUNORUBICIN	20830-81-3	SYSTEMIC/ORGAN TOXICITY		
		SUBCHRONIC TOXICITY	A	DIVISION OF DRUG BIOLOGy/NDE-R-40
DAUNORUBICIN	20830-81-3	SYSTEMIC/ORGAN TOXICITY	B	DIVISION OF DRUG BIOLOGY/NDE-R-15
DOXORUBICIN	23214-92-8	SYSTEMIC/ORGAN TOXICITY		
		SUBCHRONIC TOXICITY	A	DIVISION OF DRUG BIOLOGY/NDE-R-40
DOXORUBICIN	23214-92-8	SYSTEMIC/ORGAN TOXICITY	B	DIVISION OF DRUG BIOLOGY/NDE-R-15
EPHEDRINE	299-42-3	SYSTEMIC/ORGAN TOXICITY		
		SUBCHRONIC TOXICITY	B	DIVISION OF DRUG BIOLOGY/NDE-R-4
GOLD SODIUM THIOMALATE	39377-38-3	IMMUNOLOGIC TOXICITY		
		SUBCHRONIC TOXICITY	B	DIVISION OF DRUG BIOLOGY/NDE-R-24
GOLDTHIOMALATE	39377-38-3	IMMUNOLOGIC TOXICITY		
		SYSTEMIC/ORGAN TOXICITY	B	DIVISION OF DRUG BIOLOGY/NDE-R-24
HYDRALAZINE	86-54-4	SYSTEMIC/ORGAN TOXICITY	B	DIVISION OF DRUG BIOLOGY/NDE-R-36
HYDRALAZINE	86-54-4	IMMUNOLOGIC TOXICITY		
		SUBCHRONIC TOXICITY	B	DIVISION OF DRUG BIOLOGY/NDE-R-36
ISOPROTERENOL	7683-59-2	SYSTEMIC/ORGAN TOXICITY		
		SUBCHRONIC TOXICITY	B	DIVISION OF DRUG BIOLOGY/NDE-R-36
ISOPROTERENOL	7683-59-2	SYSTEMIC/ORGAN TOXICITY	B	DIVISION OF DRUG BIOLOGY/NDE-R-36
6-MERCAPTOPURINE	6112-76-1	REPRODUCTIVE/DEVELOPMENTAL TOXICITY/		
		SUBCHRONIC TOXICITY	B	DIVISION OF DRUG BIOLOGY/NDE-R-11
6-MERCAPTOPURINE	6112-76-1	REPRODUCTIVE/DEVELOPMENTAL TOXICITY	B	DIVISION OF DRUG BIOLOGY/NDE-R-11
MERCURIC CHLORIDE	7487-94-7	IMMUNOLOGIC TOXICITY		
		SUBCHRONIC TOXICITY	B	DIVISION OF DRUG BIOLOGY/NDE-R-24
MERCURIC CHLORIDE	7487-94-7	IMMUNOLOGIC TOXICITY		
		SYSTEMIC/ORGAN TOXICITY	B	DIVISION OF DRUG BIOLOGY/NDE-R-24

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200<

201<

TOXICOLOGY TESTING

FOOD AND DRUG ADMINISTRATION
CENTER FOR DRUGS AND BIOLOGICS

CHEMICAL	CAS NO.	TEST TYPE	STATUS	PERFORMING ORGANIZATION/PROJECT NO.
METHADONE	76-99-3	REPRODUCTIVE/DEVELOPMENTAL TOXICITY SUBCHRONIC TOXICITY	A	DIVISION OF DRUG BIOLOGY/NDE-R-11
METHYLDOPA	555-30-6	IMMUNOLOGIC TOXICITY SYSTEMIC/ORGAN TOXICITY	B	DIVISION OF DRUG BIOLOGY/NDE-R-24
METHYLDOPA	555-30-6	IMMUNOLOGIC TOXICITY SUBCHRONIC TOXICITY	B	DIVISION OF DRUG BIOLOGY/NDE-R-24
MINOXIDIL	38304-91-5	SYSTEMIC/ORGAN TOXICITY SUBCHRONIC TOXICITY	B	DIVISION OF DRUG BIOLOGY/NDE-R-36
NITROFURANTOIN	67-20-9	IMMUNOLOGIC TOXICITY SUBCHRONIC TOXICITY	B	DIVISION OF DRUG BIOLOGY/NDE-R-24
NITROFURANTOIN	67-20-9	IMMUNOLOGIC TOXICITY SYSTEMIC/ORGAN TOXICITY	B	DIVISION OF DRUG BIOLOGY/NDE-R-24
NITROUS OXIDE	10024-97-2	REPRODUCTIVE/DEVELOPMENTAL TOXICITY SUBCHRONIC TOXICITY	A	DIVISION OF DRUG BIOLOGY/NDE-R-49
NITROUS OXIDE	10024-97-2	REPRODUCTIVE/DEVELOPMENTAL TOXICITY	B	DIVISION OF DRUG BIOLOGY/NDE-R-11
D-PENICILLAMINE	52-67-5	IMMUNOLOGIC TOXICITY SYSTEMIC/ORGAN TOXICITY	B	DIVISION OF DRUG BIOLOGY/NDE-R-24
PENTAMIDINE	100-33-4	SYSTEMIC/ORGAN TOXICITY SUBCHRONIC TOXICITY	A	DIVISION OF DRUG BIOLOGY
PHENOBARBITAL	50-06-6	REPRODUCTIVE/DEVELOPMENTAL TOXICITY SUBCHRONIC TOXICITY	A	DIVISION OF DRUG BIOLOGY/NDE-R-11
PHENYLPROPANOLAMINE	14838-15-4	SYSTEMIC/ORGANIC TOXICITY SUBCHRONIC TOXICITY	B	DIVISION OF DRUG BIOLOGY/NDE-R-4
PHENYLPROPANOLAMINE	14838-15-4	ACUTE/CHRONIC TOXICITY SYSTEMIC/ORGAN TOXICITY	B	DIVISION OF DRUG BIOLOGY/NDE-R-XX
PHENYTOIN	57-41-0	REPRODUCTIVE/DEVELOPMENTAL TOXICITY SUBCHRONIC TOXICITY		
PHENYTOIN	57-41-0	NEUROLOGIC/BEHAVIORAL TOXICITY	A	DIVISION OF DRUG BIOLOGY/NDE-R-11
PRACTOLOL	6673-35-4	IMMUNOLOGIC TOXICITY SUBCHRONIC TOXICITY	B	DIVISION OF DRUG BIOLOGY/NDE-R-40
PROCAINAMIDE	51-06-9	IMMUNOLOGIC TOXICITY SUBCHRONIC TOXICITY	B	DIVISION OF DRUG BIOLOGY/NDE-R-24
PROCAINAMIDE	51-06-9	IMMUNOLOGIC TOXICITY	B	DIVISION OF DRUG BIOLOGY/NDE-R-24
PROPRANOLOL	525-66-6	IMMUNOLOGIC TOXICITY SUBCHRONIC TOXICITY	B	DIVISION OF DRUG BIOLOGY/NDE-R-24
TERBUTALINE	23031-25-6	SYSTEMIC/ORGAN TOXICITY SUBCHRONIC TOXICITY	B	DIVISION OF DRUG BIOLOGY/NDE-R-24
VERAPAMIL	52-53-9	SYSTEMIC/ORGAN TOXICITY SUBCHRONIC TOXICITY	B	DIVISION OF DRUG BIOLOGY/NDE-R-36
VITAMIN E ACETATE	7695-91-2	SYSTEMIC/ORGAN TOXICITY SUBCHRONIC TOXICITY	B	DIVISION OF DRUG BIOLOGY/NDE-4-67
			A	DIVISION OF DRUG BIOLOGY/NDE-R-4

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TOXICOLOGY TESTING

CENTERS FOR DISEASE CONTROL
NIOSH
DIVISION OF BIOMEDICAL AND BEHAVIORAL SCIENCE

CHEMICAL	CAS NO.	TEST TYPE	STATUS	PERFORMING ORGANIZATION/PROJECT NO.
*ACETALDEHYDE	75-07-0	REPRODUCTIVE/DEVELOPMENTAL TOXICITY	C	EXP. TOXICOL. BR., DBBS/VOO AYY 340
*ACETONE	67-64-1	REPRODUCTIVE/DEVELOPMENTAL TOXICITY	C	EXP. TOXICOL. BR., DBBS/VOO AYY 340
*ACETONE	67-64-1	NEUROLOGIC/BEHAVIORAL TOXICITY	B	NEURO. RES. SECT., DBBS/VOB CHY 272
*BENZALDEHYDE	100-52-7	REPRODUCTIVE/DEVELOPMENTAL TOXICITY	C	EXP. TOXICOL. BR., DBBS/VOO AYY 340
*BENZETHONIUM CHLORIDE	121-54-0	REPRODUCTIVE/DEVELOPMENTAL TOXICITY	C	EXP. TOXICOL. BR., DBBS/VOO AYY 340
*BENZYL ALCOHOL	100-51-6	REPRODUCTIVE/DEVELOPMENTAL TOXICITY	C	EXP. TOXICOL. BR., DBBS/VOO AYY 340
*BIS(2-METHOXYETHYL)ETHER	111-96-6	PHARMACOKINETICS/METABOLISM	A	EXP. TOX. BR., DBBS/VOO AHY 333
*TERT-BUTYL ALCOHOL	75-65-0	REPRODUCTIVE/DEVELOPMENTAL TOXICITY	B	NEURO. RES. SETC., DBBS/VOB AHY 276
*BUTYRALDEHYDE	123-72-8	REPRODUCTIVE/DEVELOPMENTAL TOXICITY	C	EXP. TOXICOL. BR., DBBS/VOO AYY 340
*CARBON DISULFIDE	75-15-0	MEASURING PERCUTANEOUS ABSORPTION	A	EXP. TOX. BR., DBBS/VOO JYY 335
*CARBON DISULFIDE	75-15-0	SYSTEMIC/ORGAN TOXICITY	A	ETB, DBBS, VOO LHY 339
*CINNAMALDEHYDE	104-55-2	REPRODUCTIVE/DEVELOPMENTAL TOXICITY	C	EXP. TOXICOL. BR., DBBS/VOO AYY 340
*CITRAL	5392-40-5	REPRODUCTIVE/DEVELOPMENTAL TOXICITY	C	EXP. TOXICOL. BR., DBBS/VOO AYY 340
*COPPER SLAGS	7440-50-8	FIBROGENESIS	A	TECH. SUPP. BR., DBBS/VOT IGM 383
*CROTONALDEHYDE	4170-30-3	REPRODUCTIVE/DEVELOPMENTAL TOXICITY	C	EXP. TOXICOL. BR., DBBS/VOO AYY 340
*1,2-DICHLOROETHANE	107-06-3	CARCINOGENESIS	A	MIDWEST RESEARCH INSTITUTE/VOO MHY 349
*DIETHANOLAMINE	111-42-2	REPRODUCTIVE/DEVELOPMENTAL TOXICITY	C	EXP. TOXICOL. BR., DBBS/VOO AYY 340
*N,N-DIETHYL-M-TOLUAMIDE	134-62-3	BIOCHEMICAL/CELLULAR/TISSUE EFFECTS	C	EXP. TOXICOL. BR., DBBS/VOO JYY
*DIMETHYLFORMAMIDE	68-12-2	CARCINOGENESIS	D	TECH. SUPP. BR., DBBS/VOT MHY 373
*DIMETHYL PHTHALATE	131-11-3	REPRODUCTIVE/DEVELOPMENTAL TOXICITY	A	MINORITY ENTERPRISE SERVICE ASSOC./ VOO AHY 340
*ETHANOLAMINE	141-43-5	REPRODUCTIVE/DEVELOPMENTAL TOXICITY	C	EXP. TOXICOL. BR., DBBS/VOO AYY 340
*3-ETHOXY-1-PROPANOL	111-35-3	REPRODUCTIVE/DEVELOPMENTAL TOXICITY	C	EXP. TOXICOL. BR., DBBS/VOO AYY 340
*ETHYLBENZENE	100-41-4	MEASURING PERCUTANEOUS ABSORPTION METABOLIC AND EXCRETORY PATHWAYS	A	EXP. TOX. BR., DBBS/VOO JYY 335/ VOO AHY 333
*EXTRACTS FROM WORKPLACE SAMPLES		MUTAGENESIS/GENETIC TOXICITY	B	LIB, DIV. OF RESP. DIS. STUD. VKC CCB 118
*FORMALDEHYDE	50-00-0	REPRODUCTIVE/DEVELOPMENTAL TOXICITY	C	EXP. TOXICOL. BR., DBBS/VOO AYY 340
*FOUNDRY EFFLUENTS		CARCINOGENESIS	A	EXP.TOX. BR., DBBS/VOO IYY 322
*FOUNDRY PARTICULATES		CARCINOGENESIS	A	EXP. TOXICOL. BR., DBBS/VOO MNY 320
*FURFURAL	98-01-1	REPRODUCTIVE/DEVELOPMENTAL TOXICITY	C	EXP. TOXICOL. BR., DBBS/VOO AYY 340
*GLUTARALDEHYDE	111-30-8	REPRODUCTIVE/DEVELOPMENTAL TOXICITY	C	EXP. TOXICOL. BR., DBBS/VOO AYY 340
*ISOPROPYL ALCOHOL	67-63-0	REPRODUCTIVE/DEVELOPMENTAL TOXICITY	A	NEURO. RES. SECT., DBBS/VOB AHY 276
*LEAD OXIDE	1317-36-8	SUBCHRONIC TOXICITY	C	EXP. TOXICOL. BR., DBBS/VOO VPY
*LEAD SULFIDE	1317-87-0	SUBCHRONIC TOXICITY	C	EXP. TOXICOL. BR., DBBS/VOO VPY
*MALONALDEHYDE	542-78-9	REPRODUCTIVE/DEVELOPMENTAL TOXICITY	C	EXP. TOXICOL. BR., DBBS/VOO AYY 340

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202<

TOXICOLOGY TESTING

CENTERS FOR DISEASE CONTROL
NIOSH
DIVISION OF BIOMEDICAL AND BEHAVIORAL SCIENCE

CHEMICAL	CAS NO.	TEST TYPE	STATUS	PERFORMING ORGANIZATION/PROJECT NO.
*2,4,5-TRI-METHOXY BENZALDEHYDE	4460-86-0	REPRODUCTIVE/DEVELOPMENTAL TOXICITY	C	EXP. TOXICOL. BR., DBBS/VOO AYY 340
*2-METHOXYETHANOL	109-86-4	PHARMACOKINETICS/METABOLISM	A	EXP. TOX. BR., DBBS/VOO AHY 333
*METHYL ETHYL KETONE	78-93-3	NEUROLOGIC/BEHAVIORAL TOXICITY	B	NEURO. RES. SECT., DBBS/COB CHY 272
*METHYL ISOBUTYL KETONE	108-10-1	NEUROLOGIC/BEHAVIORAL TOXICITY	B	NEURO. RES. SECT., DBBS/VOB CHY 272
*PHTHALIC ANHYDRIDE	85-44-9	PULMONARY TOXICITY	B	EXP. TOX. BR., DBBS/VOO IYY 329
*POLYCYCLIC HYDROCARBONS		URINE ANALYSIS SYSTEMS	B	LAB. INVEST. DR., DRDS/VKC CIC 112
*POLYCYCLIC HYDROCARBONS		MUTAGENESIS/GENETIC TOXICITY	B	LIB, DIV. OF RESP. DIS. STUD VKC CIC 112
*PROBENECID	57-66-9	REPRODUCTIVE/DEVELOPMENTAL TOXICITY	C	EXP. TOXICOL. BR., DBBS/VOO AYY 340
*PROPIONALDEHYDE	123-38-6	REPRODUCTIVE/DEVELOPMENTAL TOXICITY	C	EXP. TOXICOL. BR., DBBS/VOO AYY 340
*13-CIS RETINOIC ACID	4759-48-2	REPRODUCTIVE/DEVELOPMENTAL TOXICITY	C	EXP. TOXICOL. BR., DBBS/VOO AYY 340
*TRANS RETINOIC ACID	302-79-4	REPRODUCTIVE/DEVELOPMENTAL TOXICITY	C	EXP. TOXICOL. BR., DBBS/VOO AYY 340
*4,4'-THIOBIS (6-T-BUTYL-m-CRESOL)	96-69-5	REPRODUCTIVE/DEVELOPMENTAL TOXICITY	C	EXP. TOXICOL. BR., DBBS/VOO AYY 340
*TRIETHANOLAMINE	102-71-6	REPRODUCTIVE/DEVELOPMENTAL TOXICITY	C	EXP. TOXICOL. BR., DBBS/VOC AYY 340
*TRIORTHOCRESYL PHOSPHATE	78-30-8	REPRODUCTIVE/DEVELOPMENTAL TOXICITY	C	EXP. TOXICOL. BR., DBBS/VOO AYY 340
*VANADIUM PENTOXIDE	1314-62-1	IMMUNOLOGIC TOXICITY		
		PULMONARY TOXICITY	B	EXP. TOX. BR., DBBS/VOO IYY 329

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203

TOXICOLOGY TESTING

CENTERS FOR DISEASE CONTROL
CENTER FOR ENVIRONMENTAL HEALTH

CHEMICAL	CAS NO.	TEST TYPE	STATUS	PERFORMING ORGANIZATION/PROJECT NO.
DDT	50-29-3	EPIDEMIOLOGY	D	CTR. ENVIRON. HEALTH
POLYBROMINATED BIPHENYL	36355-01-8	EPIDEMIOLOGY/CARCINOGENESIS	B	MICH. DEPT. OF PUBLIC HEALTH/200-76-0625
POLYCHLORINATED BIPHENYL		EPIDEMIOLOGY	B	CTR. ENVIRON. HEALTH

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TOXICOLOGY TESTING

NATIONAL INSTITUTE OF CHILD HEALTH AND HUMAN DEVELOPMENT
CENTER FOR POPULATION RESEARCH
REPRODUCTIVE SCIENCES BRANCH

CHEMICAL	CAS NO.	TEST TYPE	STATUS	PERFORMING ORGANIZATION/PROJECT NO.
BENZAMIDINE DERIVATIVES		BIOCHEMICAL/CELLULAR/TISSUE EFFECTS		
2-ALPHA-BROMOERGOCRIPTINE	25614-03-3	REPRODUCTIVE/DEVELOPMENTAL TOXICITY	B	WASHINGTON UNIV. SCH. MED./2R01HD09422-07
		ACUTE/CHRONIC TOXICITY		
		BIOCHEMICAL/CELLULAR/TISSUE EFFECTS		
		CLINICAL TOXICOLOGY/EPIDEMIOLOGY		
CLOMID		REPRODUCTIVE/DEVELOPMENTAL TOXICITY	B	UNIV. OF CALIF. SAN DIEGO/5R01HD15162-02
		BIOCHEMICAL/CELLULAR/TISSUE EFFECTS		
DIETHYLSTILBESTROL	56-53-1	REPRODUCTIVE/DEVELOPMENTAL TOXICITY	B	UNIV. OF CALIF. SAN FRANCISCO/R01-17491
		BIOCHEMICAL/CELLULAR/TISSUE EFFECTS		
DIETHYLSTILBESTROL	56-53-1	REPRODUCTIVE/DEVELOPMENTAL TOXICITY	B	VANDERBILT UNIV./R01HD14512
		BIOCHEMICAL/CELLULAR/TISSUE EFFECTS		
BETA-ENDORPHIN	61214-51-5	REPRODUCTIVE/DEVELOPMENTAL TOXICITY	B	UNIV. OF CALIF. SAN FRANCISCO/R01-17491
		ACUTE/CHRONIC TOXICITY		
		BIOCHEMICAL/CELLULAR/TISSUE EFFECTS		
		CLINICAL TOXICOLOGY/EPIDEMIOLOGY		
ENVIRONMENTAL AGENTS		REPRODUCTIVE/DEVELOPMENTAL TOXICITY	B	UNIV. OF CALIF. , SAN DIEGO/R01HD15162
		CLINICAL TOXICOLOGY/EPIDEMIOLOGY		
GONADATROPIC RELEASING HORMONE ANALOGS		REPRODUCTIVE/DEVELOPMENTAL TOXICITY	B	YALE UNIV./R01-16282
		ACUTE/CHRONIC TOXICITY		
		BIOCHEMICAL/CELLULAR/TISSUE EFFECTS		
		CLINICAL TOXICOLOGY/EPIDEMIOLOGY		
GONADOTROPIC RELEASING HORMONE		REPRODUCTIVE/DEVELOPMENTAL TOXICITY	B	SALK INST. FOR BIOLOGICAL STUDIES P01HD13527
GONADOTROPIC RELEASING HORMONE ANALOGS		REPRODUCTIVE/DEVELOPMENTAL TOXICITY	B	UNIV. OF CALIF. SAN DIEGO/K04HD00375
		BIOCHEMICAL/CELLULAR/TISSUE EFFECTS		
GONADOTROPIC RELEASING HORMONE ANALOGS		REPRODUCTIVE/DEVELOPMENTAL TOXICITY	B	SRI-INTERNATIONAL/R01HD15258
		ACUTE/CHRONIC TOXICITY		
		BIOCHEMICAL/CELLULAR/TISSUE EFFECTS		
		CLINICAL TOXICOLOGY/EPIDEMIOLOGY		
GONADOTROPIC RELEASING HORMONE (38 ANALOGS)		REPRODUCTIVE/DEVELOPMENTAL TOXICITY	B	VANDERBILT UNIV. SCH. MED./1R01HD16453-01
GONADOTROPIC RELEASING HORMONE ANALOGS		REPRODUCTIVE/DEVELOPMENTAL TOXICITY	B	UNIV. OF CALIF., SAN DIEGO/5R01HD14084-04
		BIOCHEMICAL/CELLULAR/TISSUE EFFECTS		
		CLINICAL TOXICOLOGY/EPIDEMIOLOGY		
LITHIUM		REPRODUCTIVE/DEVELOPMENTAL TOXICITY	B	UCLA HARBOR-UCLA MED. CTR., TORRANCE CALIF 1K04HD00442-01
		REPRODUCTIVE/DEVELOPMENTAL TOXICITY		
ALPHA-MELANOCYTE STIMULATING HORMONE		SUBCHRONIC TOXICITY	B	UNIV. OF TEXAS/R01-17677
	9002-79-3	ACUTE/CHRONIC TOXICITY		
		BIOCHEMICAL/CELLULAR/TISSUE EFFECTS		

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TOXICOLOGY TESTING

NATIONAL INSTITUTE OF CHILD HEALTH AND HUMAN DEVELOPMENT
CENTER FOR POPULATION RESEARCH
REPRODUCTIVE SCIENCES BRANCH

CHEMICAL	CAS NO.	TEST TYPE	STATUS	PERFORMING ORGANIZATION/PROJECT NO.
		CLINICAL TOXICOLOGY/EPIDEMIOLOGY		
		REPRODUCTIVE/DEVELOPMENTAL TOXICITY	B	UNIV. OF CALIF. SAN DIEGO/5R01HD15162-02
METKEPHAMID		BIOCHEMICAL/CELLULAR/TISSUE EFFECTS		
		REPRODUCTIVE/DEVELOPMENTAL TOXICITY	B	UNIV. OF FLORIDA/K08-00473
MUTAGENIC AGENTS		BIOCHEMICAL/CELLULAR/TISSUE EFFECTS		
		REPRODUCTIVE/DEVELOPMENTAL TOXICITY		OAK RIDGE NATL. LABORATORIES/R01-17345
PERGOLIDE MESYLATE	66104-23-2	ACUTE/CHRONIC TOXICITY		
		BIOCHEMICAL/CELLULAR/TISSUE EFFECTS		
		CLINICAL TOXICOLOGY/EPIDEMIOLOGY		
		REPRODUCTIVE/DEVELOPMENTAL TOXICITY	B	UNIVERSITY OF CALIFORNIA, SAN DIEGO 5R01 HD15162-02
DELTA 1-TESTOLACTONE	968-93-4			
WITH CLOMIPHENE CITRATE	50-41-9	ACUTE/CHRONIC TOXICITY		
		BIOCHEMICAL/CELLULAR/TISSUE EFFECTS		
		CLINICAL TOXICOLOGY/EPIDEMIOLOGY		
		REPRODUCTIVE/DEVELOPMENTAL TOXICITY	B	UNIV. OF CALIF., LOS ANGELES/R01HD15132
TOBACCO		BIOCHEMICAL/CELLULAR/TISSUE EFFECTS		
		REPRODUCTIVE/DEVELOPMENTAL TOXICITY	B	WORCESTER FDN. EXPTL. BIOLOGY/R01-17220

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TOXICOLOGY TESTING

NATIONAL INSTITUTE OF CHILD HEALTH AND HUMAN DEVELOPMENT
CENTER FOR POPULATION RESEARCH
CONTRACEPTIVE DEVELOPMENT BRANCH

CHEMICAL	CAS NO.	TEST TYPE	STATUS	PERFORMING ORGANIZATION/PROJECT NO.
LEVONORGESTREL		CHRONIC TOXICITY REPRODUCTIVE/DEVELOPMENTAL TOXICITY	A	BIOTEK INC./N01-02847
LEVONORGETREL		CHRONIC TOXICITY REPRODUCTIVE/DEVELOPMENTAL TOXICITY	A	R AND D CORPORATION/N01-032829

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TOXICOLOGY TESTING

NATIONAL INSTITUTE OF CHILD HEALTH AND HUMAN DEVELOPMENT
CENTER FOR POPULATION RESEARCH
CONTRACEPTIVE EVALUATION BRANCH

CHEMICAL	CAS NO.	TEST TYPE	STATUS	PERFORMING ORGANIZATION/PROJECT NO.
CONTRACEPTIVE ESTROGENS AND PROGESTINS		CLINICAL TOXICOLOGY/EPIDEMIOLOGY CARCINOGENESIS	A	US DHHS/CENTERS FOR DISEASE CONTROL/ Y01-81037
CONTRACEPTIVE ESTROGENS AND PROGESTINS		BIOCHEMICAL/CELLULAR/TISSUE EFFECTS	B	JOHNS HOPKINS UNIV./N01-32816
CONTRACEPTIVE ESTROGENS AND PROGESTINS		BIOCHEMICAL/CELLULAR/TISSUE EFFECTS	A	GEORGE WASHINGTON UNIV./N01HD12803
CONTRACEPTIVE PROGESTINS		SYSTEMIC/ORGAN TOXICITY	B	WAKE FOREST UNIV./N01-32800
CONTRACEPTIVE PROGESTINS		SYSTEMIC/ORGAN TOXICITY	B	WAKE FOREST UNIV./N01-HD-32800
CONTRACEPTIVE SPERMICIDES		CLINICAL TOXICOLOGY/EPIDEMIOLOGY REPRODUCTIVE/DEVELOPMENTAL TOXICITY	B	BOSTON UNIV./N01-22820

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>607

TOXICOLOGY TESTING

NATIONAL INSTITUTE OF CHILD HEALTH AND HUMAN DEVELOPMENT
CENTER FOR RESEARCH FOR MOTHERS AND CHILDREN
MENTAL RETARDATION AND DEVELOPMENT DISABILITIES BRANCH

CHEMICAL	CAS NO.	TEST TYPE	STATUS	PERFORMING ORGANIZATION/PROJECT NO.
ALCOHOL	64-17-5	CLINICAL TOXICOLOGY/EPIDEMIOLOGY	B	UNIV. OF WASHINGTON, SEATTLE, WASH./ P30 02274(013)
AMINOPHYLLINE	317-34-0	NEUROLOGICAL/BEHAVIORAL TOXICITY	B	UNIV. OF CHICAGO, CHICAGO, ILL./ P30 04583(005)
ARSENIC	7440-38-2	NEUROLOGICAL/BEHAVIORAL TOXICITY	B	YESHIVA UNIV., N.Y./P30 01799(029)
CADMIUM	7440-43-9	PHARMACOKINETICS/METABOLISM	B	UNIV. OF NORTH CAROLINA, CHAPEL HILL, N.C. P30 03110(003)
CARBON DISULFIDE	75-15-0	NEUROLOGICAL/BEHAVIORAL TOXICITY	B	YESHIVA UNIV., N.Y./P30 01799(029)
CHLORAMPHENICOL	56-75-7	NEUROLOGICAL/BEHAVIORAL TOXICITY	B	UNIV. OF CHICAGO, CHICAGO, ILL./ P30 04583(005)
CYCLOPHOSPHAMIDE	50-18-0	BIOCHEMICAL/CELLULAR/TISSUE EFFECTS	B	UNIV. OF WASHINGTON, SEATTLE, WASH./ P30 02274(014)
CYTOCHALASIN D	14930-96-2	BIOCHEMICAL/CELLULAR/TISSUE EFFECTS	B	UNIV. OF WESHINGTON, SEATTLE, WASH./ P30 02274(014)
ETHANOL	64-17-5	NEUROLOGICAL/BEHAVIORAL TOXICITY	B	UNIV. OF CHICAGO, CHICAGO, ILL./ P30 04583(005)
HEXANE	110-54-3	NEUROLOGICAL/BEHAVIORAL TOXICITY	B	YESHIVA UNIV., N.Y./P30 01799(029)
LEAD	7439-92-1	PHARMACOKINETICS/METABOLISM	B	UNIV. OF NORTH CAROLINA, CHAPEL HILL, N.C. P30 03110(003)
LEAD	7439-92-1	NEUROLOGIC/BEHAVIORAL	B	UNIV. OF NORTH CAROLINA, CHAPEL HILL, N.C. P30 03110(029)
LEAD	7439-92-1	CLINICAL TOXICOLOGY/EPIDEMIOLOGY	A	CHILDREN'S HOSPITAL CORP., BOSTON, MASS. R01-17407
MERCURY	7439-97-6	NEUROLOGIC/BEHAVIORAL TOXICITY	B	CHILDREN'S HOSPITAL CORP., BOSTON, MASS. P30 18655(064)
MERCURY	7439-97-6	PHARMACOKINETICS/METABOLISM	B	UNIV. OF NORTH CAROLINA, CHAPEL HILL, N.C. P30 03110(003)
NEUROPSYCHOTIC DRUGS		PHARMACOKINETICS/METABOLISM	B	UNIV. OF NORTH CAROLINA, CHAPEL HILL, N.C. P30 03110(002)
NICOTINE	54-11-5	CLINICAL TOXICOLOGY/EPIDEMIOLOGY	B	UNIV. OF WASHINGTON, SEATTLE, WASH./ P30 02274(013)
PHENYTOIN	57-41-0	NEUROLOGICAL/BEHAVIORAL TOXICITY	B	UNIV. OF CHICAGO, CHICAGO, ILL./ P30 04583(005)
PYRIDOXINE		NEUROLOGICAL/BEHAVIORAL TOXICITY	B	YESHIVA UNIV., N.Y./P30 01799(029)
SODIUM VALPROATE		NEUROLOGICAL/BEHAVIORAL TOXICITY	B	UNIV. OF CHICAGO, CHICAGO, ILL./ P30 04583(005)
ZINC PYRIDINETHIONE		NEUROLOGICAL/BEHAVIORAL TOXICITY	B	YESHIVA UNIV., N.Y./P30 01799(029)

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TOXICOLOGY TESTING

NATIONAL INSTITUTE OF CHILD HEALTH AND HUMAN DEVELOPMENT
CENTER FOR RESEARCH FOR MOTHERS AND CHILDREN
CLINICAL NUTRITION AND EARLY DEVELOPMENT BRANCH, PREGNANCY AND PERINATOLOGY SECTION

CHEMICAL	CAS NO.	TEST TYPE	STATUS	PERFORMING ORGANIZATION/PROJECT NO.
ACETAMINOPHEN	103-90-2	CLINICAL TOXICOLOGY/EPIDEMIOLOGY	A	CHILDREN'S HOSPITAL CORP., BOSTON, MASS. R01-17958
ANTIBIOTICS		CLINICAL TOXICOLOGY/EPIDEMIOLOGY	A	CHILDREN'S HOSPITAL CORP., BOSTON, MASS. R01-17958
ASPIRIN	50-78-2	CLINICAL TOXICOLOGY/EPIDEMIOLOGY	A	CHILDREN'S HOSPITAL CORP., BOSTON, MASS. R01-17958
HEPARIN	9005-49-6	CLINICAL TOXICOLOGY/EPIDEMIOLOGY	A	CHILDREN'S HOSPITAL CORP., BOSTON, MASS. R01-17958
PANCURONIUM BROMIDE	15500-66-0	CLINICAL TOXICOLOGY/EPIDEMIOLOGY	A	CHILDREN'S HOSPITAL CORP., BOSTON, MASS. R01-17958

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TOXICOLOGY TESTING

NATIONAL INSTITUTE OF CHILD HEALTH AND HUMAN DEVELOPMENT
CENTER FOR RESEARCH FOR MOTHERS AND CHILDREN
CLINICAL NUTRITION AND EARLY DEVELOPMENT BRANCH, GENETICS AND TERATOLOGY SECTION

CHEMICAL	CAS NO.	TEST TYPE	STATUS	PERFORMING ORGANIZATION/PROJECT NO.
ACETALDEHYDE	75-07-0	BIOCHEMICAL/CELLULAR/TISSUE EFFECTS	A	NORTH SHORE UNIV. HOSP., MANHASSET, NY RO1-17375
ALCOHOL	64-17-5	BIOCHEMICAL/CELLULAR/TISSUE EFFECTS	A	NORTH SHORE UNIV. HOSP., MANHASSET, NY RO1-17375
ALCOHOL	64-17-5	EPIDEMIOLOGY	B	RESEARCH FOUNDATION FOR MENTAL HYGIENE, ALBANY, NY/RO1-15909
ALCOHOL	64-17-5	BIOCHEMICAL/CELLULAR/TISSUE EFFECTS	B	NEW YORK BLOOD CENTER, NY/RO1-19146
CAFFEINE	58-08-2	EPIDEMIOLOGY	B	RESEARCH FOUNDATION FOR MENTAL HYGIENE, ALBANY, NY/RO1-15909
CAFFEINE	58-08-2	BIOCHEMICAL/CELLULAR/TISSUE EFFECTS	A	NORTH SHORE UNIV. HOSP., MANHASSET, NY RO1-17375
CAFFEINE	58-08-2	MUTAGENESIS/GENETIC TOXICITY	B	UNIV. OF COLORADO, DENVER, COLORADO PO1 02080(007)
CANNABINOL		BIOCHEMICAL/CELLULAR/TISSUE EFFECTS	A	NORTH SHORE UNIV. HOSP., MANHASSET, NY RO1-17375
DILANTIN	57-41-0	BIOCHEMICAL/CELLULAR/TISSUE EFFECTS	B	NEW YORK BLOOD CENTER, NY/RO1-19146
NICOTINE	54-11-5	EPIDEMIOLOGY	B	RESEARCH FOUNDATION FOR MENTAL HEALTH, ALBANY, NY/RO1-15909
NICOTINE	54-11-5	BIOCHEMICAL/CELLULAR/TISSUE EFFECTS	A	NORTH SHORE UNIV. HOSP., MANHASSET, NY RO1-17375
SODIUM ARSENITE	7784-46-5	BIOCHEMICAL/CELLULAR/TISSUE EFFECTS	B	NEW YORK BLOOD CENTER, NY/RO1-19146
THIOCYANATE	302-04-5	BIOCHEMICAL/CELLULAR/TISSUE EFFECTS	A	NORTH SHORE UNIV. HOSP., MANHASSET, NY RO1-17375

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TOXICOLOGY TESTING

NATIONAL INSTITUTE OF CHILD HEALTH AND HUMAN DEVELOPMENT
CENTER FOR RESEARCH FOR MOTHERS AND CHILDREN
NUTRITION AND ENDOCRINOLOGY SECTION

CHEMICAL	CAS NO.	TEST TYPE	STATUS	PERFORMING ORGANIZATION/PROJECT NO.
CYSTEAMINE	60-23-1	BIOCHEMICAL/CELLULAR/TISSUE EFFECTS	B	MASSACHUSETTS GEN. HOSP./R01-17364

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TOXICOLOGY TESTING

NATIONAL HEART, LUNG AND BLOOD INSTITUTE
DIVISION OF HEART AND VASCULAR DISEASES

CHEMICAL	CAS NO.	TEST TYPE	STATUS	PERFORMING ORGANIZATION/PROJECT NO.
ALIPHATIC NITRILES		CHRONIC TOXICITY BIOCHEMICAL/CELLULAR/TISSUE EFFECTS PHARMACOKINETICS/METABOLISM	B	DARTMOUTH COLLEGE/R01HL14127
ALLYLAMINE	107-11-9	SYSTEMIC/ORGAN TOXICITY	B	UNIVERSITY OF TEXAS, GALVESTON/R01HL26189
ANTIBIOTICS		BIOCHEMICAL/CELLULAR/TISSUE EFFECTS SYSTEMIC/ORGAN TOXICITY	B	MOUNT SINAI SCHOOL OF MEDICINE
ANTIOXIDANTS		BIOCHEMICAL/CELLULAR/TISSUE EFFECTS SYSTEMIC/ORGAN TOXICITY	B	UNIVERSITY OF MICHIGAN/R01 HL-29499
CALCIUM, ALSO POTASSIUM AND SODIUM		BIOCHEMICAL/CELLULAR/TISSUE EFFECTS PHARMACOKINETICS/METABOLISM	B	MICHIGAN STATE UNIV./R01 HL-30143
CARBOXYLIC ACIDS		CHRONIC TOXICITY SYSTEMIC/ORGAN TOXICITY	B	LOYOLA UNIVERSITY MEDICAL CENTER R01 HL-27652
CYANIDE		CHRONIC TOXICITY MUTAGENESIS/GENETIC TOXICITY	B	DARTMOUTH COLLEGE/R01 HL-14127
CYCLOHEXAMINE	2201-15-2	SYSTEMIC/ORGAN TOXICITY	B	UNIVERSITY OF TEXAS, GALVESTON/R01HL26189
DIETHYLAMINE	109-89-7	SYSTEMIC/ORGAN TOXICITY	B	UNIVERSITY OF TEXAS, GALVESTON/R01HL26189
DIGITALIS		SYSTEMIC/ORGAN TOXICITY	D	COLLEGE OF PHYSICIANS AND SURGEONS, NEW YORK/P01-30557
ETHANOL	64-17-5	PHARMACOKINETICS/METABOLISM REPRODUCTIVE/DEVELOPMENTAL TOXICITY SYSTEMIC/ORGAN TOXICITY	B	CHILDRENS HOSP. NATL. MEDICAL LAB./ R01 HL-30231
ISOPPOPYLAMINE	75-31-0	SYSTEMIC/ORGAN TOXICITY	B	UNIVERSITY OF TEXAS, GALVESTON/R01HL26189
LIDOCAINE	137-58-6	BIOCHEMICAL/CELLULAR/TISSUE EFFECTS PHARMACOKINETICS/METABOLISM	B	MICHIGAN STATE UNIV./R01 HL-30143
MONOETHYLAMINE	75-04-7	SYSTEMIC/ORGAN TOXICITY	B	UNIVERSITY OF TEXAS, GALVESTON/R01HL26189
NIFEDIPINE	21829-25-4	CHRONIC TOXICITY SYSTEMIC/ORGAN TOXICITY	B	LOYOLA UNIVERSITY MEDICAL CENTER R01 HL-27652
NITRILES		CHRONIC TOXICITY MUTAGENESIS/GENETIC TOXICITY	B	DARTMOUTH COLLEGE/R01 HL-14127
NITRITE	14797-65-0	CHRONIC TOXICITY BIOCHEMICAL/CELLULAR/TISSUE EFFECTS PHARMACOKINETICS/METABOLISM	B	DARTMOUTH COLLEGE/R01HL14127
NITRITES		CHRONIC TOXICITY MUTAGENESIS/GENETIC TOXICITY	B	DARTMOUTH COLLEGE/R01 HL-14127
NITROPRUSSIDE	13755-38-9	CHRONIC TOXICITY BIOCHEMICAL/CELLULAR/TISSUE EFFECTS PHARMACOKINETICS/METABOLISM	B	DARTMOUTH COLLEGE/R01HL14127
NITROPRUSSIDE	15078-28-1	CHRONIC TOXICITY MUTAGENESIS/GENETIC TOXICITY	B	DARTMOUTH COLLEGE/R01 HL-14127
OXIDANTS		BIOCHEMICAL/CELLULAR/TISSUE EFFECTS SYSTEMIC/ORGAN TOXICITY	B	UNIVERSITY OF MICHIGAN/R01 HL-29499
OXYGEN	7782-44-7	BIOCHEMICAL/CELLULAR/TISSUE EFFECTS SYSTEMIC/ORGAN TOXICITY	B	UNIVERSITY OF MICHIGAN/R01 HL-29499

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TOXICOLOGY TESTING

NATIONAL HEART, LUNG AND BLOOD INSTITUTE
DIVISION OF HEART AND VASCULAR DISEASES

CHEMICAL	CAS NO.	TEST TYPE	STATUS	PERFORMING ORGANIZATION/PROJECT NO.
PEROXIDASES				
		BIOCHEMICAL/CELLULAR/TISSUE EFFECTS		
PEROXIDASES		SYSTEMIC/ORGAN TOXICITY		
		PHARMACOKINETICS/METABOLISM	B	UNIVERSITY OF MICHIGAN/R01 HL-29499
PHENYLALKYL AMINES		SYSTEMIC/ORGAN TOXICITY		
		CHRONIC TOXICITY	B	EMORY UNIV./R01 HL-30286
		CLINICAL TOXICOLOGY/EPIDEMIOLOGY		
		SYSTEMIC/ORGAN TOXICITY		
PHENYLALKYLAMINES			B	UNIVERSITY OF SOUTH CAROLINA
		ACUTE TOXICITY		P01 HL-27430-01
		SYSTEMIC/ORGAN TOXICITY		
PICROTOXIN			B	LOYOLA UNIVERSITY MEDICAL CENTER
	124-87-8	CHRONIC TOXICITY		R01 HL-27652
PYRIDINE		SYSTEMIC/ORGAN TOXICITY		
	110-86-1	CHRONIC TOXICITY	B	GEORGETOWN UNIVERSITY/R01 HL-28406
		SYSTEMIC/ORGAN TOXICITY		
QUINIDINE			B	LOYOLA UNIVERSITY MEDICAL CENTER
	56-54-2	BIOCHEMICAL/CELLULAR/TISSUE EFFECTS		R01 HL-27652
RUTHENIUM		PHARMACOKINETICS/METABOLISM		
	7440-18-8	CHRONIC TOXICITY	B	MICHIGAN STATE UNIV./R01 HL-30143
		BIOCHEMICAL/CELLULAR/TISSUE EFFECTS		
RUTHENIUM COORDINATION		PHARMACOKINETICS/METABOLISM		
COMPLEXES		CHRONIC TOXICITY	B	DARTMOUTH COLLEGE/R01HL14127
		BIOCHEMICAL/CELLULAR/TISSUE EFFECTS		
TETRODOTOXIN		PHARMACOKINETICS/METABOLISM		
	4368-28-9	CHRONIC TOXICITY	B	DARTMOUTH COLLEGE/R01HL14127
		CLINICAL TOXICOLOGY/EPIDEMIOLOGY		
TETRODOTOXIN		SYSTEMIC/ORGAN TOXICITY		
	4368-28-9	CHRONIC TOXICITY	B	UNIVERSITY OF NORTH CAROLINA/P01 HL-27430
		SYSTEMIC/ORGAN TOXICITY		
TOBACCO SMOKE			B	LOYOLA UNIVERSITY MEDICAL CENTER
TRIETHYLAMINE		BIOCHEMICAL/CELLULAR/TISSUE EFFECTS		R01 HL-27652
VERAPAMIL	121-44-8	SYSTEMIC/ORGAN TOXICITY	B	UNIV. OF WASHINGTON/P01HL03174
	52-53-9	CHRONIC TOXICITY	B	UNIVERSITY OF TEXAS, GALVESTON/R01HL26189
		CLINICAL TOXICOLOGY/EPIDEMIOLOGY		
VERAPAMIL		SYSTEMIC/ORGAN TOXICITY		
	52-53-9	CHRONIC TOXICITY	B	UNIVERSITY OF NORTH CAROLINA/P01 HL-27430
		SYSTEMIC/ORGAN TOXICITY		
			B	LOYOLA UNIVERSITY MEDICAL CENTER

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215<

TOXICOLOGY TESTING

NATIONAL HEART, LUNG AND BLOOD INSTITUTE
DIVISION OF LUNG DISEASES

CHEMICAL	CAS NO.	TEST TYPE	STATUS	PERFORMING ORGANIZATION/PROJECT NO.
ACROLEIN	107-02-8	BIOCHEMICAL/CELLULAR/TISSUE EFFECTS		
ACROLEIN	107-02-8	PULMONARY TOXICITY CHRONIC TOXICITY BIOCHEMICAL/CELLULAR/TISSUE EFFECTS	B	UNIV. OF VERMONT/P50 HL14212
ADRIAMYCIN	23214-92-8	PULMONARY TOXICITY BIOCHEMICAL/CELLULAR/TISSUE EFFECTS	B	UNIV. OF FLORIDA/R23 HL-29407
AEROALLERGENS		PULMONARY TOXICITY IMMUNOLOGIC TOXICITY	B	UNIVERSITY OF MIAMI/R01 HL-26029
AEROSOLS		PULMONARY TOXICITY BIOCHEMICAL/CELLULAR/TISSUE EFFECTS IMMUNOLOGIC TOXICITY	C	MEDICAL COLL. OF WISCONSIN/R01 HL-29327
AEROSOLS		PULMONARY TOXICITY EPIDEMIOLOGY	B	TULANE UNIV./P50HL15092
AIR POLLUTANTS		PULMONARY TOXICITY SYSTEMIC/ORGAN TOXICITY BIOCHEMICAL/CELLULAR/TISSUE EFFECTS	B	HARVARD UNIV./R01 HL-31021
ALKALOIDS		PULMONARY TOXICITY	D	JOHNS HOPKINS UNIVERSITY/R01 HL-33410
ASBESTOS	1332-21-4	PULMONARY TOXICITY BIOCHEMICAL/CELLULAR/TISSUE EFFECTS IMMUNOLOGIC TOXICITY	C	NORTHEASTERN OHIO UNIV./R23 HL-31070
AUTOMOBILE EXHAUST		PULMONARY TOXICITY CLINICAL TOXICOLOGY/EPIDEMIOLOGY PHARMACOKINETICS/METABOLISM	B	TULANE UNIV./P50HL15092
BENZO (A) PYRENE	73467-76-2	PULMONARY TOXICITY BIOCHEMICAL/CELLULAR/TISSUE EFFECTS PHARMACOKINETICS/METABOLISM	B	LOUISIANA STATE UNIVERSITY/R01 HL-25820
BERYLLIUM	7440-41-7	PULMONARY TOXICITY BIOCHEMICAL/CELLULAR/TISSUE EFFECTS	B	MICHIGAN STATE UNIVERSITY/R01 HL-25962
BLEOMYCIN	11056-06-7	PULMONARY TOXICITY BIOCHEMICAL/CELLULAR/TISSUE EFFECTS	B	UNIV. OF VERMONT/P50HL14212
BLEOMYCIN	11056-06-7	PULMONARY TOXICITY CHRONIC TOXICITY	B	NEW ENGLAND MED. CTR./R01HL25261
BLEOMYCIN	11056-06-7	PULMONARY TOXICITY BIOCHEMICAL/CELLULAR/TISSUE EFFECTS	B	MAYO FOUNDATION/R23 HL-28029
BLEOMYCIN	11056-06-7	PULMONARY TOXICITY ACUTE/CHRONIC TOXICITY	B	UNIVERSITY OF MIAMI/R01 HL-26029
BLEOMYCIN		PULMONARY TOXICITY SYSTEMIC/ORGAN TOXICITY BIOCHEMICAL/TISSUE/CELLULAR EFFECTS	C	MAYO FOUNDATION/R23 HL-28029
BUTYLATED HYDROXYTOLUENE (BHT)	128-37-0	PULMONARY TOXICITY	D	SUNY AT STONYBRIDGE/R01 HL-23874
CHLORCYCLIZINE	82-93-9	PULMONARY TOXICITY SYSTEMIC/ORGAN TOXICITY BIOCHEMICAL/CELLULAR/TISSUE EFFECTS	C	UNIV. OF TEXAS/R01 HL-29463

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216<

TOXICOLOGY TESTING

NATIONAL HEART, LUNG AND BLOOD INSTITUTE
DIVISION OF LUNG DISEASES

CHEMICAL	CAS NO.	TEST TYPE	STATUS	PERFORMING ORGANIZATION/PROJECT NO.
		PHARMACOKINETICS/METABOLISM		
		PULMONARY TOXICITY	B	UNIVERSITY OF MISSISSIPPI/R01 HL-20622
CHLORIMIPRAMINE	303-49-1	BIOCHEMICAL/CELLULAR/TISSUE EFFECTS		
		PHARMACOKINETICS/METABOLISM		
		PULMONARY TOXICITY	B	UNIVERSITY OF MISSISSIPPI/R01 HL-20622
CHLORINE GAS	7782-50-5	BIOCHEMICAL/CELLULAR/TISSUE EFFECTS		
		IMMUNOLOGIC TOXICITY		
		PULMONARY TOXICITY		
		EPIDEMIOLOGY	B	TULANE UNIV./P50HL15092
CHLORPHENTERMINE	461-78-9	BIOCHEMICAL/CELLULAR/TISSUE EFFECTS		
		PHARMACOKINETICS/METABOLISM		
		PULMONARY TOXICITY	B	UNIVERSITY OF MISSISSIPPI/R01 HL-20622
CHLORPROMAZINE	50-53-3	BIOCHEMICAL/CELLULAR/TISSUE EFFECTS		
		PULMONARY TOXICITY	B	UNIVERSITY OF NORTH CAROLINA/R01 HL-29222
COFFEE DUST		BIOCHEMICAL/CELLULAR/TISSUE EFFECTS		
		IMMUNOLOGIC TOXICITY		
		PULMONARY TOXICITY		
		EPIDEMIOLOGY	B	TULANE UNIV./P50HL15092
CORTICOSTEROIDS		BIOCHEMICAL/TISSUE/CELLULAR EFFECTS		
		PULMONARY TOXICITY	B	NATIONAL JEWISH HOSPITAL/R01 HL-30513
CORTICOSTEROIDS		SYSTEMIC/ORGAN TOXICITY	B	NATIONAL JEWISH HOSPITAL AND RES. CTR. R01 HL-30513
		PULMONARY TOXICITY		
COTTON DUST		BIOCHEMICAL/TISSUE/CELLULAR EFFECTS		
		PULMONARY TOXICITY	B	EMORY UNIVERSITY/R01 HL-28674
COTTON DUST		BIOCHEMICAL/CELLULAR/TISSUE EFFECTS		
		IMMUNOLOGIC TOXICITY		
		PULMONARY TOXICITY		
		EPIDEMIOLOGY	B	TULANE UNIV./P50HL15092
CYCLIZINE	82-92-8	BIOCHEMICAL/CELLULAR/TISSUE EFFECTS		
		PHARMACOKINETICS/METABOLISM		
		PULMONARY TOXICITY	B	UNIVERSITY OF MISSISSIPPI/R01 HL-20622
CYCLOPHOSPHAMIDE	50-18-0	CHRONIC TOXICITY		
(TOXIC METABOLITES)		BIOCHEMICAL/CELLULAR/TISSUE EFFECTS		
		PULMONARY TOXICITY	C	UNIV. OF FLORIDA/R23 HL-29407
HYDANTOINS		CHRONIC TOXICITY		
		PULMONARY TOXICITY	B	MAYO FOUNDATION/R23 HL-28029
HYDROCHLORIC ACID	7647-01-0	CHRONIC TOXICITY		
		PULMONARY TOXICITY	B	HARVARD UNIV./P50HL19170

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TOXICOLOGY TESTING

NATIONAL HEART, LUNG AND BLOOD INSTITUTE
DIVISION OF LUNG DISEASES

CHEMICAL	CAS NO.	TEST TYPE	STATUS	PERFORMING ORGANIZATION/PROJECT NO.
IMIDAZOLES		BIOCHEMICAL/CELLULAR/TISSUE EFFECTS		
		PULMONARY TOXICITY	B	UNIVERSITY OF NORTH CAROLINA/RO1 HL-29222
IMIDAZOLIDINES		CHRONIC TOXICITY		
		PULMONARY TOXICITY	B	MAYO FOUNDATION/R23 HL-28029
IMIPRAMINE	50-49-7	BIOCHEMICAL/CELLULAR/TISSUE EFFECTS		
		PHARMACOKINETICS/METABOLISM		
		PULMONARY TOXICITY	B	UNIVERSITY OF MISSISSIPPI/RO1 HL-20622
		PULMONARY TOXICITY	C	MEDICAL COLLEGE OF WISCONSIN/RO1 HL-29390
KAOLIN	1332-58-7	BIOCHEMICAL/CELLULAR/TISSUE EFFECTS		
		IMMUNOLOGIC TOXICITY		
		PULMONARY TOXICITY		
		EPIDEMIOLOGY	B	TULANE UNIV./P50HL15092
KAOLIN	1332-58-7	BIOCHEMICAL/CELLULAR/TISSUE EFFECTS		
		PULMONARY TOXICITY	B	UNIV. OF VERMONT/P50HL14212
LYMPHOKINES		BIOCHEMICAL/CELLULAR/TISSUE EFFECTS		
		PULMONARY TOXICITY	B	UNIV. OF CONNECTICUT/RO1 HL-29382
MACROLIDE ANTIBIOTICS		SYSTEMIC/ORGAN TOXICITY	B	NATIONAL JEWISH HOSPITAL AND RES. CTR. RO1 HL-30513
		PULMONARY TOXICITY		
MONOCROTALINE		BIOCHEMICAL/CELLULAR/TISSUE EFFECTS		
		PULMONARY TOXICITY	D	MICHIGAN STATE UNIVERSITY/RO1 HL-32244
MOUNT ST. HELENS DUST		PULMONARY TOXICITY	B	UNIVERSITY OF VERMONT/RO1 HL-27389
NITROFURANTOIN	67-20-9	CHRONIC TOXICITY		
		PULMONARY TOXICITY	B	MAYO FOUNDATION/R23 HL-28029
NITROFURANTOIN		SYSTEMIC/ORGAN TOXICITY	D	UNIVERSITY OF BRITISH COLUMBIA/RO1 HL-32082
		PULMONARY TOXICITY		
NITROFURANTOIN	67-20-9	BIOCHEMICAL/CELLULAR/TISSUE EFFECTS		
		PULMONARY TOXICITY	B	UNIVERSITY OF MIAMI/RO1 HL-26029
NITROFURANTOIN	67-20-9	ACUTE/CHRONIC TOXICITY		
		PULMONARY TOXICITY		
		SYSTEMIC/ORGAN TOXICITY	C	MAYO FOUNDATION/R23 HL-28029
NITROGEN DIOXIDE	10102-44-0	BIOCHEMICAL/CELLULAR/TISSUE EFFECTS		
		PULMONARY TOXICITY	B	LOUISIANA STATE UNIV./RO1HL16029
NITROGEN OXIDES		CLINICAL TOXICOLOGY/EPIDEMIOLOGY		
		PULMONARY TOXICITY	B	UNIVERSITY OF ROCHESTER/RO1 HL-29257
OXIDANTS		BIOCHEMICAL/CELLULAR/TISSUE EFFECTS	B	GRADUATE HOSPITAL, PHILADELPHIA RO1 HL-31831
		PHARMACOKINETICS/METABOLISM		
OXYGEN	7782-44-7	BIOCHEMICAL/CELLULAR/TISSUE EFFECTS		
		PULMONARY TOXICITY	B	UNIVERSITY OF MIAMI/RO1 HL-26029
OXYGEN	7782-44-7	BIOCHEMICAL/CELLULAR/TISSUE EFFECTS	C	LATTER DAY SAINTS HOSPITAL/RO1 HL-26030
OXYGEN	7782-44-7	BIOCHEMICAL/CELLULAR/TISSUE EFFECTS		
		PULMONARY TOXICITY	C	GRADUATE HOSPITAL, PHILADELPHIA/RO1 HL-31831
OXYGEN	7782-44-7	PULMONARY TOXICITY		
		REPRODUCTIVE/DEVELOPMENTAL TOXICITY		
		SYSTEMIC/ORGAN TOXICITY	B	STANFORD UNIV/RO1 HL-30394

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TOXICOLOGY TESTING

NATIONAL HEART, LUNG AND BLOOD INSTITUTE
DIVISION OF LUNG DISEASES

CHEMICAL	CAS NO.	TEST TYPE	STATUS	PERFORMING ORGANIZATION/PROJECT NO.
OZONE	10028-15-6	BIOCHEMICAL/CELLULAR/TISSUE EFFECTS		
OZONE	10028-15-6	PULMONARY TOXICITY CLINICAL TOXICOLOGY/EPIDEMIOLOGY	B	LOUISIANA STATE UNIV./R01HL16029
OZONE	0028-15-6	PULMONARY TOXICITY BIOCHEMICAL/TISSUE/CELLULAR EFFECTS	B	UNIVERSITY OF ROCHESTER/R01 HL-29257
OZONE	0028-15-6	PULMONARY TOXICITY BIOCHEMICAL/TISSUE/CELLULAR EFFECTS	C	PENNSYLVANIA STATE UNIV/R01 HL-31245
OZONE, ENVIRONMENTAL POLLUTANTS		PULMONARY TOXICITY	D	SUNY AT STONY BROOK/R01 HL-31429
PARAQUAT	4685-14-7	BIOCHEMICAL/CELLULAR/TISSUE EFFECTS	B	UNIVERSITY OF CALIFORNIA/R01 HL-24136
PEROXIDES		PULMONARY TOXICITY BIOCHEMICAL/TISSUE/CELLULAR EFFECTS	B	UNIVERSITY OF MIAMI/R01 HL-26029
PETROXIDASES		PULMONARY TOXICITY BIOCHEMICAL/CELLULAR/TISSUE EFFECTS	D	UNIVERSITY OF BRITISH COLUMBIA/R01 HL-32082
PHENOTHIAZINES		PULMONARY TOXICITY BIOCHEMICAL/CELLULAR/TISSUE EFFECTS	B	UNIVERSITY OF CALIFORNIA, SAN FRANCISCO R23 HL-29246
PHENTERMINE	122-09-8	PULMONARY TOXICITY BIOCHEMICAL/CELLULAR/TISSUE EFFECTS PHARMACOKINETICS/METABOLISM	B	UNIVERSITY OF NORTH CAROLINA/R01 HL-29222
PHOSPHORAMIDE		PULMONARY TOXICITY CHRONIC TOXICITY BIOCHEMICAL/CELLULAR/TISSUE EFFECTS	B	UNIVERSITY OF MISSISSIPPI/R01 HL-20622
PILOCARPINE	92-13-7	PULMONARY TOXICITY BIOCHEMICAL/CELLULAR/TISSUE EFFECTS	B	UNIV. OF FLORIDA/R23 HL-29407
PUROMYCIN	53-79-2	PULMONARY TOXICITY BIOCHEMICAL/CELLULAR/TISSUE EFFECTS	B	UNIVERSITY OF NORTH CAROLINA/R01 HL-29222
RESPIRATORY SYSTEM TOXINS		PULMONARY TOXICITY BIOCHEMICAL/CELLULAR/TISSUE EFFECTS	B	UNIVERSITY OF NORTH CAROLINA/R01 HL-29222
SILICA	7631-86-9	PULMONARY TOXICITY BIOCHEMICAL/CELLULAR/TISSUE EFFECTS IMMUNOLOGIC TOXICITY PULMONARY TOXICITY	D	MEDICAL COLLEGE OF GEORGIA/R01 HL-31422
SILICA	7631-86-9	EPIDEMIOLOGY BIOCHEMICAL/CELLULAR/TISSUE EFFECTS	B	TULANE UNIV./P50HL15092
STEROIDS AND CORTICOSTEROIDS		PULMONARY TOXICITY PULMONARY TOXICITY	B	UNIV. OF VERMONT/P50HL14212
TOBACCO SMOKE		SYSTEMIC/ORGAN TOXICITY BIOCHEMICAL/CELLULAR/TISSUE EFFECTS	C	UNIV. OF TEXAS/R01 HL-29463

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TOXICOLOGY TESTING

NATIONAL HEART, LUNG AND BLOOD INSTITUTE
DIVISION OF LUNG DISEASES

CHEMICAL	CAS NO.	TEST TYPE	STATUS	PERFORMING ORGANIZATION/PROJECT NO.
		PULMONARY TOXICITY	B	LOUISIANA STATE UNIV./R01HL16029
TOBACCO SMOKE		PULMONARY TOXICITY	B	LOUISIANA STATE UNIV./R01 HL-25820
TOLUENE DIISOCYANATE	26471-62-5	BIOCHEMICAL/CELLULAR/TISSUE EFFECTS		
		IMMUNOLOGIC TOXICITY		
		PULMONARY TOXICITY		
		EPIDEMIOLOGY	B	TULANE UNIV./P50HL15092
TOXALBUMINS		BIOCHEMICAL/CELLULAR/TISSUE EFFECTS		
		PULMONARY TOXICITY	B	UNIVERSITY OF NORTH CAROLINA/R01 HL-29222
WR 2721	20537-88-6	BIOCHEMICAL/CELLULAR/TISSUE EFFECTS	B	NEW ENGLAND MED. CTR./R01HL25261

219<

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TOXICOLOGY TESTING

NATIONAL HEART, LUNG AND BLOOD INSTITUTE
DIVISION OF BLOOD DISEASES AND RESOURCES

CHEMICAL	CAS NO.	TEST TYPE	STATUS	PERFORMING ORGANIZATION/PROJECT NO.
ACETOPHENETIDIN	62-44-2	PHARMACOKINETICS/METABOLISM	C	MEDICAL UNIV. OF SOUTH CAROLINA
HEPARIN		SYSTEMIC/ORGAN TOXICITY		RO1 HL-30038
		CHRONIC TOXICITY		
		BIOCHEMICAL/CELLULAR/TISSUE EFFECTS		
		PHARMACOKINETICS/METABOLISM		
		SYSTEMIC/ORGAN TOXICITY		
HEPARIN-DERIVED ANTICOAGULANTS		CHRONIC TOXICITY	B	UNIV. OF IOWA/RO1 HL-29797
		BIOCHEMICAL/CELLULAR/TISSUE EFFECTS		
		PHARMACOKINETICS/METABOLISM		
OXYGENMETABOLITES		SYSTEMIC/ORGAN TOXICITY	B	UNIV. OF IOWA/RO1 HL-29797
PHENYLAMINES		BIOCHEMICAL/CELLULAR/TISSUE EFFECTS	B	YESHIVA UNIVERSITY/RO1 HL-13399
		PHARMACOKINETICS/METABOLISM	B	MEDICAL UNIV. OF SOUTH CAROLINA
SNAKE VENOM PROTEASES		SYSTEMIC/ORGAN TOXICITY		RO1 HL-30038
		BIOCHEMICAL/CELLULAR/TISSUE EFFECTS	B	ROSWELL PARK MEMORIAL INSTITUTE
SOUTHERN COPPERHEAD VENOM				RO1 HL-22996
		BIOCHEMICAL/CELLULAR/TISSUE EFFECTS	B	USC CANCER CENTER/RO1 HL-31389

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220<

TOXICOLOGY TESTING

NATIONAL HEART, LUNG AND BLOOD INSTITUTE
DIVISION OF INTRAMURAL RESEARCH

CHEMICAL	CAS NO.	TEST TYPE	STATUS	PERFORMING ORGANIZATION/PROJECT NO.
ADRIAMYCIN	23214-92-8	CHRONIC TOXICITY BIOCHEMICAL/CELLULAR/TISSUE EFFECTS PHARMACOKINETICS/METABOLISM SYSTEMIC/ORGAN TOXICITY	B	LABORATORY OF CHEMICAL PHARMACOLOGY Z01 HL 00944-01
ASPIRIN	50-78-2	BIOCHEMICAL/CELLULAR/TISSUE EFFECTS PHARMACOKINETICS/METABOLISM	B	LABORATORY OF CHEMICAL PHARMACOLOGY Z01 HL-00859-01
BILIRUBIN	635-65-4	BIOCHEMICAL/CELLULAR/TISSUE EFFECTS	B	LAB. OF BIOCHEMISTRY/Z01HL00237
BROMOBENZENE	108-86-1	ACUTE TOXICITY BIOCHEMICAL/CELLULAR/TISSUE EFFECTS PHARMACOKINETICS/METABOLISM SYSTEMIC/ORGAN TOXICITY	B	LABORATORY OF CHEMICAL PHARMACOLOGY Z01 HL-00950-01
BROMOBENZENE	108-86-1	ACUTE TOXICITY BIOCHEMICAL/CELLULAR/TISSUE EFFECTS PHARMACOKINETICS/METABOLISM SYSTEMIC/ORGAN TOXICITY	B	LABORATORY OF CHEMICAL PHARMACOLOGY Z01 HL-00951-01
BROMOBENZENE	108-86-1	ACUTE TOXICITY BIOCHEMICAL/CELLULAR/TISSUE EFFECTS PHARMACOKINETICS/METABOLISM SYSTEMIC/ORGAN TOXICITY	B	LABORATORY OF CHEMICAL PHARMACOLOGY Z01 HL-00952-01
BROMOBENZENE	108-86-1	ACUTE TOXICITY BIOCHEMICAL/CELLULAR/TISSUE EFFECTS PHARMACOKINETICS/METABOLISM SYSTEMIC/ORGAN TOXICITY	B	LABORATORY OF CHEMICAL PHARMACOLOGY Z01 HL-00968-02
P-BROMOPHENOL	106-41-2	ACUTE TOXICITY BIOCHEMICAL/CELLULAR/TISSUE EFFECTS PHARMACOKINETICS/METABOLISM SYSTEMIC/ORGAN TOXICITY	B	LABORATORY OF CHEMICAL PHARMACOLOGY Z01 HL-00952-01
CHLOROFORM	67-66-3	ACUTE TOXICITY BIOCHEMICAL/CELLULAR/TISSUE EFFECTS PHARMACOKINETICS/METABOLISM SYSTEMIC/ORGAN TOXICITY	B	LABORATORY OF CHEMICAL PHARMACOLOGY Z01 HL-00953-01
DAUNOMYCIN	20830-81-3	CHRONIC TOXICITY BIOCHEMICAL/CELLULAR/TISSUE EFFECTS PHARMACOKINETICS/METABOLISM SYSTEMIC/ORGAN TOXICITY	B	LABORATORY OF CHEMICAL PHARMACOLOGY

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TOXICOLOGY TESTING

NATIONAL HEART, LUNG AND BLOOD INSTITUTE
DIVISION OF INTRAMURAL RESEARCH

CHEMICAL	CAS NO.	TEST TYPE	STATUS	PERFORMING ORGANIZATION/PROJECT NO.
DAUNORUBICIN	20830-81-3	BIOCHEMICAL/CELLULAR/TISSUE EFFECTS		Z01 HL-00944-01
		CHRONIC TOXICITY		
DAUNORUBICIN	20830-81-3	BIOCHEMICAL/CELLULAR/TISSUE EFFECTS	B	PATHOLOGY BRANCH/Z01 HL-03757-02
DESIPRAMINE	50-47-5	CHRONIC TOXICITY	B	PATHOLOGY BRANCH/Z01 HL-03759-02
		CLINICAL TOXICOLOGY		
		PHARMACOKINETICS/METABOLISM		
		SYSTEMIC/ORGAN TOXICITY	B	LABORATORY OF CHEMICAL PHARMACOLOGY Z01 HL-00945-01
FURAZOLIDONE				
FUROSEMIDE		BIOCHEMICAL/CELLULAR/TISSUE EFFECTS	B	PATHOLOGY BRANCH/Z01 HL-03756-02
	54-31-9	CHRONIC TOXICITY		
		BIOCHEMICAL/CELLULAR/TISSUE EFFECTS		
		SYSTEMIC/ORGAN TOXICITY	B	LABORATORY OF CHEMICAL PHARMACOLOGY Z01 HL-00858-01
FUROSEMIDE	54-31-9	CHRONIC TOXICITY		
		BIOCHEMICAL/CELLULAR/TISSUE EFFECTS		
		PHARMACOKINETICS/METABOLISM		
		SYSTEMIC/ORGAN TOXICITY	B	LABORATORY OF CHEMICAL PHARMACOLOGY Z01 HL-00860-01
HALOCARBONS				
		BIOCHEMICAL/CELLULAR/TISSUE EFFECTS		
		IMMUNOLOGIC TOXICITY	B	LABORATORY OF CHEMICAL PHARMACOLOGY Z01 HL-00966-02
HALOGENS				
HALOHYDROCARBONS		BIOCHEMICAL/CELLULAR/TISSUE EFFECTS	B	LABORATORY OF CHEMICAL PHARMACOLOGY Z01 HL-00940
HALOTHANE	151-67-7	BIOCHEMICAL/CELLULAR/TISSUE EFFECTS	B	LABORATORY OF CHEMICAL PHARMACOLOGY Z01 HL-00962-02
OPIATES		CHRONIC TOXICITY	B	HYPERTENSION-ENDOCRINE BRANCH Z01 HL-0192-02

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223<

TOXICOLOGY TESTING

NATIONAL INSTITUTE OF ARTHRITIS, DIABETES, AND DIGESTIVE AND KIDNEY DISEASES

CHEMICAL	CAS NO.	TEST TYPE	STATUS	PERFORMING ORGANIZATION/PROJECT NO.
ACETAMINOPHEN	103-90-2	PHARMACOKINETICS/METABOLISM		
		BIOCHEMICAL/CELLULAR/TISSUE EFECTS		
		SYSTEMIC/ORGAN TOXICITY		
ACRYLONITRILE			B	UNIVERSITY OF WASHINGTON/1R01AM30699
	107-13-1	BIOCHEMICAL/CELLULAR/TISSUE EFFECTS		
		PHARMACOKINETICS/METABOLISM		
		SYSTEMIC/ORGAN TOXICITY		
ACRYLONITRILE			B	BRIGHAM AND WOMEN'S HOSPITAL/K04AM00600
	107-13-1	BIOCHEMICAL/CELLULAR/TISSUE EFFECTS		
		PHARMACOKINETICS/METABOLISM		
		SYSTEMIC/ORGAN TOXICITY		
ALUMINUM			B	BRIGHAM AND WOMEN'S HOSPITAL/R01AM25229
	7429-90-5	BIOCHEMICAL/CELLULAR/TISSUE EFFECTS		
		CLINICAL TOXICOLOGY/EPIDEMIOLOGY		
		SYSTEMIC/ORGAN TOXICITY		
AMINOGLYCOSIDE ANTIBIOTICS			C	UNIVERSITY OF WASHINGTON/K08AM01244
		METABOLISM		
		ORGAN TOXICITY		
AMINOGLYCOSIDE ANTIBIOTICS			B	SUNY-STONYBROOK/5R01AM27061
		PHARMACOKINETICS/METABOLISM		
		SYSTEMIC/ORGAN TOXICITY		
AMINOGLYCOSIDE ANTIBIOTICS			B	UNIV. OF CALIFORNIA SAN DIEGO/R01AM32159
		PHARMACOKINETICS/METABOLISM		
		SYSTEMIC/ORGAN TOXICITY		
ANALGESICS			C	NORTH CAROLINA STATE UNIVERSITY RALEIGH R01AM31862
		PHARMACOKINETICS/METABOLISM		
		SYSTEMIC/ORGAN TOXICITY		
ANESTHETICS			B	NIH (NIASSK)/Z01AM19200
ARSENIC		SYSTEMIC/ORGAN TOXICITY	B	UNIV. OF ARIZONA/5R01AM16715
	7440-38-2	ACUTE TOXICITY		
ARSENIC (COMPOUNDS)		PHARMACOKINETICS/METABOLISM	B	UNIV. OF MINNESOTA, ST. PAUL/5R01AM18101
		PHARMACOKINETICS/METABOLISM	B	UNIVERSITY OF MINNESOTA, ST. PAUL 5R01AM18101
ASPIRIN	50-78-2	CHRONIC TOXICITY		
		CLINICAL TOXICOLOGY/EPIDEMIOLOGY		
		PHARMACOKINETICS/METABOLISM		
AZATHIOPRINE	446-86-6	CHRONIC TOXICITY	B	NIH (NIAMDD)/1Z01AM41041
		CLINICAL TOXICOLOGY/EPIDEMIOLOGY		
		IMMUNOLOGIC TOXICITY		
		SYSTEMIC/ORGAN TOXICITY		
		MUTAGENESIS/GENETIC TOXICITY		
BENZO(A)PYRENE	50-32-8	CARCINOGENESIS	B	NIH (NIAMDD)/1Z01AM41040
CARBON TETRACHLORIDE	56-23-5	BIOCHEMICAL/CELLULAR/TISSUE EFFECTS	B	NIH (NIADDK)/Z01AM24640
		PHARMACOKINETCS/METABOLISM		
		SYSTEMIC/ORGAN TOXICITY	B	UNIVERSITY OF CALIFORNIA, SAN FRANCISCO 5R01AM19843
CHLORPROMAZINE	50-53-3	BIOCHEMICAL/CELLULAR/TISSUE EFFECTS		
		PHARMACOKINETICS/METABOLISM		
		SYSTEMIC/ORGAN TOXICITY		
CYCLOPHOSPHAMIDE	50-18-0	CHRONIC TOXICITY	B	HAHNEMANN UNIVERSITY/R01AM32586

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TOXICOLOGY TESTING

NATIONAL INSTITUTE OF ARTHRITIS, DIABETES, AND DIGESTIVE AND KIDNEY DISEASES

CHEMICAL	CAS NO.	TEST TYPE	STATUS	PERFORMING ORGANIZATION/PROJECT NO.
CYSTEAMINE	60-23-1	CLINICAL TOXICOLOGY/EPIDEMIOLOGY SYSTEMIC/ORGAN TOXICITY IMMUNOLOGIC TOXICITY MUTAGENESIS/GENETIC TOXICITY BIOCHEMICAL/CELLULAR/TISSUE EFFECTS PHARMACOKINETICS/METABOLISM	B	NIH (NIAMDD)/1Z01AM41040
CYSTEAMINE	60-23-1	SYSTEMIC/ORGAN TOXICITY BIOCHEMICAL/CELLULAR/TISSUE EFFECTS PHARMACOKINETICS/METABOLISM	B	BRIGHAM AND WOMEN'S HOSPITAL/K04AM00600
DEMETHYLCHLORTETRACYCLINE	127-33-3	SYSTEMIC/ORGAN TOXICITY BIOCHEMICAL/CELLULAR/TISSUE EFFECTS IMMUNOLOGIC TOXICITY	B	BRIGHAM AND WOMEN'S HOSPITAL/R01AM25229
DIBROMOCHLOROPROPANE	96-12-8	BIOCHEMICAL/CELLULAR/TISSUE EFFECTS PHARMACOKINETICS/METABOLISM SYSTEMIC/ORGAN TOXICITY	B	UNIV. OF CALIFORNIA SAN DIEGO/K08AM01165
DIMETHYLNITROSAMINE	62-75-9	BIOCHEMICAL/CELLULAR/TISSUE EFFECTS SYSTEMIC/ORGAN TOXICITY PHARMACOKINETICS/METABOLISM	B	UNIVERSITY OF CALIFORNIA, SAN FRANCISCO 5R01AM19843
DOPAMINE	51-61-6	BIOCHEMICAL/CELLULAR/TISSUE EFFECTS PHARMACOKINETIC/METABOLISM SYSTEMIC/ORGAN TOXICITY	B	UNIVERSITY OF CALIFORNIA, SAN FRANSISCO 5R01AM19843
ENFLUREANE	13838-16-9	BIOCHEMICAL/CELLULAR/TISSUE EFFECTS CLINICAL TOXICOLOGY/EPIDEMIOLOGY PHARMACOKINETICS/METABOLISM SYSTEMIC/ORGAN TOXICITY	B	DANA-FARBER CANCER INSTITUTE/R01AM31899
EPICHLOROHYDRIN	106-89-8	BIOCHEMICAL/CELLULAR/TISSUE EFFECTS PHARMACOKINETICS/METABOLISM SYSTEMIC/ORGAN TOXICITY	B	UNIVERSITY OF ARIZONA/R01AM16715
ETHIONINE	13073-35-3	BIOCHEMICAL/CELLULAR/TISSUE EFFECTS PHARMACOKINETICS/METABOLISM SYSTEMIC/ORGAN TOXICITY	B	UNIVERSTIY OF CALIFORNIA, SAN FRANCISCO R01AM19843
ETHYLENE DIBROMIDE	106-93-4	BIOCHEMICAL/CELLULAR/TISSUE EFFECTS PHARMACOKINETICS/METABOLISM SYSTEMIC/ORGAN TOXICITY	B	UNIVERSITY OF CALIFORNIA, SAN FRANCISCO 5R01AM19843
			B	UNIVERSITY OF CALIFORNIA, SAN FRANCISCO

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TOXICOLOGY TESTING

NATIONAL INSTITUTE OF ARTHRITIS, DIABETES, AND DIGESTIVE AND KIDNEY DISEASES

225<

CHEMICAL	CAS NO.	TEST TYPE	STATUS	PERFORMING ORGANIZATION/PROJECT NO.
				R01AM19843
FLUORENES		CARCINOGENESIS		
		PHARMACOKINETICS/METABOLISM		
		SYSTEMIC/ORGAN TOXICITY	B	YESHIVA UNIVERSITY/2P50AM17702
6-FLUOROBENZO(A)PYRENE		CARCINOGENESIS	B	NIH (NIADDK)/Z01AM24640
GENTAMICIN	1403-66-3	SYSTEMIC/ORGAN TOXICITY	B	SUNY-STONYBROOK/5R01AM27061
GENTAMICIN	1403-66-3	BIOCHEMICAL/CELLULAR/TISSUE EFFECTS	B	UNIVERSITY OF MICHIGAN-ANN ARBOR 1R01AM30879
GENTAMICIN	1403-66-3	PHARMACOKINEICS/METABOLISM		
		SYSTEMIC/ORGAN TOXICITY	C	NORTH CAROLINA STATE UNIVERSITY, RALEIGH R01AM31862
GOLD		CLINICAL TOXICOLOGY/EPIDEMIOLOGY		
		IMMUNOLOGIC TOXICITY	B	BRIGHAM AND WOMEN'S HOSPITAL/R01AM30486
HALOTHANE	151-67-7	SYSTEMIC/ORGAN TOXICITY	B	UNIV. OF ARIZONA/5R01AM16715
3-HYDROXYACETNILIDE	621-42-1	BIOCHEMICAL/CELLULAR/TISSUE EFFECTS		
		PHARMACOKINETICS/METABOLISM	B	UNIVERSITY OF WASHINGTON/R01AM30699
IRON	7439-89-6	BIOCHEMICAL/CELLULAR/TISSUE EFFECTS		
		NUTRITIONAL STUDIES	C	CORNELL UNIVERSITY, ITHACA/R23AM33058
ISONIAZID	54-85-3	PHARMACOKINETICS/METABOLISM		
		BIOCHEMICAL/CELLULAR/TISSUE EFFECTS		
		SYSTEMIC/ORGAN TOXICITY	B	UNIVERSITY OF WASHINGTON/1R01AM30699
LEVODOPA	59-92-7	BIOCHEMICAL/CELLULAR/TISSUE EFFECTS		
		PHARMACOKINETICS/METABOLISM		
		SYSTEMIC/ORGAN TOXICITY	B	DANA-FARBER CANCER INSTITUE/R01AM31899
MERCURIC CHLORIDE	7487-94-7	BIOCHEMICAL/CELLULAR/TISSUE EFFECTS		
		SYSTEMIC/ORGAN TOXICITY	B	UNIVERSITY OF MICHIGAN AT ANN ARBOR R01AM30879
METHYLCHOLANTHRENE	56-49-5	BIOCHEMICAL/CELLULAR/TISSUE EFFECTS		
		CARCINOGENESIS		
		SYSTEMIC/ORGAN TOXICITY	B	UNIVERSITY OF CALIFORNIA, SAN FRANCISCO R01AM19843
NETILMICIN	56311-56-1	BIOCHEMICAL/CELLULAR TISSUE EFFECTS		
		SYSTEMIC/ORGAN TOXICITY	B	STATE UNIVERSITY NEW YORK STONY BROOK R01AM27061
OCHRATOXIN A	303-47-9	CLINICAL TOXICOLOGY		
		BIOCHEMICAL/CELLULAR/TISSUE EFFECTS		
		SYSTEMIC/ORGAN TOXICITY	B	CASE WESTERN RESERVE UNIV./1R01AM27987
PENICILLAMINE	52-67-5	CLINICAL TOXICOLOGY/EPIDEMIOLOGY		
		IMMUNOLOGIC TOXICITY	B	BRIGHAM AND WOMEN'S HOSPITAL/R01AM30486
PHENOBARBITAL	50-06-6	BIOCHEMICAL/CELLULAR/TISSUE EFFECTS		
		SYSTEMIC/ORGAN TOXICITY	B	UNIVERSITY OF CALIFORNIA, SAN FRANCISCO 5R01AM19843

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TOXICOLOGY TESTING

NATIONAL INSTITUTE OF ARTHRITIS, DIABETES, AND DIGESTIVE AND KIDNEY DISEASES

CHEMICAL	CAS NO.	TEST TYPE	STATUS	PERFORMING ORGANIZATION/PROJECT NO.
PHORBOL ESTERS		BIOCHEMICAL/CELLULAR/TISSUE EFFECTS CLINICAL TOXICOLOGY/EPIDEMIOLOGY CARCINOGENESIS SYSTEMIC/ORGAN TOXICITY	C	COLUMBIA UNIV./R23AM33663
CIS-PLATINUM	15663-27-1	BIOCHEMICAL/CELLULAR/TISSUE EFFECTS SYSTEMIC/ORGAN TOXICITY	B	UNIVERSITY OF MICHIGAN-ANN ARBOR 1R01AM30879
PLATINUM (COMPOUNDS)		PHARMACOKINETICS/METABOLISM BIOCHEMICAL/CELLULAR/TISSUE EFFECTS	B	UNIVERSITY OF MINNESOTA, ST. PAUL 5R01AM18101
RICIN	9009-86-3	CLINICAL TOXICOLOGY/EPIDEMIOLOGY CARCINOGENESIS REPRODUCTIVE/DEVELOPMENTAL TOXICITY	D	MEMORIAL HOSPITAL FOR CANCER AND ALLIED DISEASES/ R01AM34762
STREPTOZOTOCIN	18883-66-4	BIOCHEMICAL/CELLULAR/TISSUE EFFECTS CHRONIC TOXICITY SYSTEMIC/ORGAN TOXICITY	B	UNIVERSITY OF MASSACHUSETTS MEDICAL SCH. R01AM25306
STREPTOZOTOCIN	18883-66-4	BIOCHEMICAL/CELLULAR/TISSUE EFFECTS CHRONIC TOXICITY SYSTEMIC/ORGAN TOXICITY	B	SOUTHERN ILLINOIS UNIV. AT EDWARDSVILLE R23AM32389
STREPTOZOTOCIN	18883-66-4	BIOCHEMICAL/CELLULAR/TISSUE EFFECTS CHRONIC TOXICITY SYSTEMIC/ORGAN TOXICITY	B	UNIVERSITY OF MEDICINE AND DENTISTRY OF NJ R01AM32447
STREPTOXOTOCIN	18883-66-4	BIOCHEMICAL/CELLULAR/TISSUE EFFECTS CHRONIC TOXICITY SYSTEMIC/ORGAN TOXICITY	B	WASHINGTON UNIVERSITY/R23AM33629
SUCCINIMIDES		BIOCHEMICAL/CELLULAR/TISSUE EFFECTS PHARMACOKINETICS/METABOLISM SYSTEMIC/ORGAN TOXICITY	B	MARSHALL UNIVERSITY R01AM31210
SULFANILAMIDE	63-74-1	BIOCHEMICAL/CELLULAR/TISSUE EFFECTS PHARMACOKINETICS/METABOLISM SYSTEMIC/ORGAN TOXICITY	B	HAHNEMANN UNIVERSITY/R01AM32586

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TOXICOLOGY TESTING

NATIONAL INSTITUTE OF ARTHRITIS, DIABETES, AND DIGESTIVE AND KIDNEY DISEASES

CHEMICAL	CAS NO.	TEST TYPE	STATUS	PERFORMING ORGANIZATION/PROJECT NO.
THIOACETAMIDE	62-55-5	BIOCHEMICAL/CELLULAR/TISSUE EFFECTS		R01AM19843
		PHARMACOKINETICS/METABOLISM		
		SYSTEMIC/ORGAN TOXICITY		
TOBRAMYCIN	32986-56-4	SYSTEMIC/ORGAN TOXICITY	B	UNIVERSITY OF CALIFORNIA SAN FRANCISCO
TOXIN B (CHLOSTRIDIUM)		BIOCHEMICAL/CELLULAR/TISSUE EFFECTS	B	SUNY-STONYBROOK/5R01AM27061
		SYSTEMIC/ORGAN TOXICITY	C	UNIVERSITY HOSPITAL (BOSTON)/R01AM34583

227<

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TOXICOLOGY TESTING

NATIONAL INSTITUTE OF ALLERGY AND INFECTIOUS DISEASES

CHEMICAL	CAS NO.	TEST TYPE	STATUS	PERFORMING ORGANIZATION/PROJECT NO.
ACYCLOVIR	59277-89-3	CLINICAL TOXICOLOGY/EPIDEMIOLOGY	B	UNIV. OF ALABAMA, BIRMINGHAM/NO1-AI-12667
ACYCLOVIR	59277-89-3	BIOCHEMICAL/CELLULAR/TISSUE EFFECTS	B	YALE UNIV./NO1-AI-12665
ACYCLOVIR	59277-89-3	BIOCHEMICAL/CELLULAR/TISSUE EFFECTS	B	NEW YORK UNIVERSITY/NO1 AI 12663
ACYCLOVIR	59277-89-3	ACUTE/CHRONIC TOXICITY	B	UNIVERSITY OF UTAH/NO1 AI 22670
ADENINE ARABINOSIDE	5536-17-4	CLINICAL TOXICOLOGY/EPIDEMIOLOGY	B	UNIV. OF ALABAMA, BIRMINGHAM/NO1-AI-12667
ADENINE ARABINOSIDE	5536-17-4	BIOCHEMICAL/CELLULAR/TISSUE EFFECTS	B	SOUTHERN RESEARCH INSTITUTE, BIRMINGHAM R01-AI-17456-03
ADENINE ARABINOSIDE MONOPHOSPHATE	29984-33-6	CLINICAL TOXICOLOGY/EPIDEMIOLOGY	B	LELAND STANFORD JR. UNIV./NO1-AI-12676
S-ADENOSYL-L-METHIONINE ANALOGS		BIOCHEMICAL/CELLULAR/TISSUE EFFECTS	D	SOUTHERN RESEARCH INSTITUTE/NO1-AI-42555
ARA-A	5536-17-4	BIOCHEMICAL/CELLULAR/TISSUE EFFECTS	B	UNIV. OF UTAH/R01-AI-20161-03
ARABINOSYLTHYMINE		BIOCHEMICAL/CELLULAR/TISSUE EFFECTS	B	NEW YORK UNIV./NO1-AI-12663
BV-ARA-U		ACUTE/CHRONIC TOXICITY	B	TULANE UNIVERSITY/NO1 AI 22671
BVDU (BROMOVINYLDEOXYURIDINE)	69304-47-8	BIOCHEMICAL/CELLULAR/TISSUE EFFECTS	B	NEW YORK UNIVERSITY/NO1 AI 12663
BVDU (BROMOVINYLDEOXYURIDINE)	69304-47-8	ACUTE/CHRONIC TOXICITY	B	UNIVERSITY OF UTAH/NO1 AI 22670
CF3DURD		BIOCHEMICAL/CELLULAR/TISSUE EFFECTS	B	UNIV. OF WISCONSIN/R01-AI-19043-04
DHPG		BIOCHEMICAL/CELLULAR/TISSUE EFFECTS	B	NEW YORK UNIVERSITY/NO1-AI-12663
DHPG		BIOCHEMICAL/CELLULAR/TISSUE EFFECTS	B	YALE UNIVERSITY/NO1-AI-12665
DHPG		ACUTE/CHRONIC TOXICITY	B	UNIVERSITY OF UTAH/NO1-AI-22670
DHPG		ACUTE/CHRONIC TOXICITY	B	TULANE UNIVERSITY/NO1-AI-22671
DEAZUPURINE ANALOGS		BIOCHEMICAL/CELLULAR/TISSUE EFFECTS	D	UNIVERSITY OF MICHIGAN/NO1-AI-42554
FIAC		BIOCHEMICAL/CELLULAR/TISSUE EFFECTS	B	NEW YORK UNIVERSITY/NO1 AI 12663
FIAC		BIOCHEMICAL/CELLULAR/TISSUE EFFECTS	B	YALE UNIVERSITY/NO1 AI 12665
FIAC		ACUTE/CHRONIC TOXICITY	B	UNIVERSITY OF UTAH/NO1 AI 22670
FIAC		ACUTE/CHRONIC TOXICITY	B	TULANE UNIVERSITY/NO1-AI-22671
IDURD		BIOCHEMICAL/CELLULAR/TISSUE EFFECTS	B	UNIVERSITY OF WISCONSIN/R01-AI-19043-04
ISOQUINOLINES AND RELATED ANALOGS		BIOCHEMICAL/CELLULAR/TISSUE EFFECTS	D	UNIVERSITY OF TEXAS/NO1-AI-42557
N^2-SUBSTITUTED GUANINES		BIOCHEMICAL/CELLULAR/TISSUE EFFECTS	D	UNIVERSITY OF MASSACHUSETTS/NO1-AI-42556
PHOSPHONOFORMATE	63585-09-01	BIOCHEMICAL/CELLULAR/TISSUE EFFECTS	B	YALE UNIV./NO1-AI-12665
PHOSPHONOFORMATE	63585-09-01	BIOCHEMICAL/CELLULAR/TISSUE EFFECTS	B	NEW YORK UNIV./NO1-AI-12663
PHOSPHONOFORMATE	63585-09-01	ACUTE/CHRONIC TOXICITY	B	UNIVERSITY OF UTAH/NO1 AI 22670
RIBAVIRIN	36791-04-5	BIOCHEMICAL/CELLULAR/TISSUE EFFECTS	B	NEW YORK UNIV./NO1-AI-12663
RIBAVARIN	36791-04-5	BIOCHEMICAL/CELLULAR/TISSUE EFFECTS	B	YALE UNIV./NO1-AI-12665

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229<

TOXICOLOGY TESTING

NATIONAL INSTITUTE OF NEUROLOGICAL AND COMMUNICATIVE DISORDERS AND STROKE
INTRAMURAL PROGRAM

CHEMICAL	CAS NO.	TEST TYPE	STATUS	PERFORMING ORGANIZATION/PROJECT NO.
ADENOSINE TRIPHOSPHATE WITH PHENYLALKYLAMINES	56-65-5	BIOCHEMICAL/CELLULAR/TISSUE EFFECTS	B	NEUROTOXICOLOGY SECTION Z01 NS 02451-04 (LENP)
ALCOHOLISM DRINKING		NEUROLOGIC/BEHAVIORAL TOXICITY	B	DEVELOPMENTAL NEUROLOGY BRANCH Z01 NS 02109-11 (DNB)
ANESTHETICS		NEUROLOGIC/BEHAVIORAL TOXICITY	B	LAB. NEUROPHYSIOLOGY/Z01 NS 02019-12 LNP
ANTIBIOTICS		SYSTEMIC/ORGAN TOXICITY	B	COMMUNICATIVE DISORDERS PROGRAM Z01 NS 02466-04 (CDP)
ANTICONVULSANTS		NEUROLOGIC/BEHAVIORAL TOXICITY	B	LAB. NEUROPHYSIOLOGY/Z01 NS 02019-12 LNP
ARTIFICIAL FOOD DYES		NEUROLOGIC/BEHAVIORAL TOXICITY	B	NEUROTOXICOLOGY SECT./Z01 NS 02264-08 (LENP)
6-AZAURACIL	461-89-2	BIOCHEMICAL/CELLULAR/TISSUE EFFECTS	B	LAB. MOLECULAR BIOLOGY/Z01 NS 01244-20 LMB
ALPHA BUNGAROTOXIN	11023-79-4	NEUROLOGIC/BEHAVIORAL TOXICITY	B	LAB. NEURO-OTOLARYNG./Z01 NS 02216-09 LNO
CARBAMAZEPINE WITH PHENOBARBITAL WITH PRIMIDONE WITH ETHOSUXIMIDE	298-46-4 50-06-6 125-33-7 77-67-8	BIOCHEMICAL/CELLULAR/TISSUE EFFECTS	B	EXPERIMENTAL THERAPEUTICS BRANCH Z01 NS 02256-08 (ET)
CHOLERA TOXIN ADENINE NUCLEOTIDES		BIOCHEMICAL/CELLULAR/TISSUE EFFECTS	B	DEVELOPMENTAL METABOLIC NEUROLOGY BRANCH Z01 NS 01309-19 (DMN)
CONVULSANTS		NEUROLOGIC/BEHAVIORAL TOXICITY	B	LAB. NEUROPHYSIOLOGY/Z01 NS 02019-12 LNP
DECOYININE	2004-04-8	BIOCHEMICAL/CELLULAR/TISSUE EFFECTS	B	LAB. MOLECULAR BIOLOGY/Z01 NS 01244-20 LMB
CIS-DICHLORODIAMINE PLATINUM	15663-27-1	NEUROLOGIC/BEHAVIORAL TOXICITY	B	NEUROTOXICOLOGY SECTION Z01 NS 02264-08 (LENP)
DIETHYLSTILBESTROL	56-53-1	NEUROLOGIC/BEHAVIORAL TOXICITY	B	NEUROTOXICOLOGY SECTION Z01 NS 02264-08 (LENP)
ERYTHROSIN B	16423-68-0	BIOCHEMICAL/CELLULAR/TISSUE EFFECTS	B	NEUROTOXICOLOGY SECTION Z01 NS 02451-04 (LENP)
HADACIDIN	689-13-4	BIOCHEMICAL/CELLULAR/TISSUE EFFECTS	B	LAB. MOLECULAR BIOLOGY/Z01 NS 01244-20 LMB
HALOAROMATIC COMPOUNDS WITH BENZOPYRANS WITH XANTHENES WITH FLUORESCEINS		BIOCHEMICAL/CELLULAR/TISSUE EFFECTS	B	NEUROTOXICOLOGY SECTION Z01 NS 02451-04 (LENP)
HEAVY METALS WITH CIS-PLATINUM COMPOUNDS WITH ADENINE NUCLEOTIDES		BIOCHEMICAL/CELLULAR/TISSUE EFFECTS	B	SURGICAL NEUROLOGY BRANCH Z01 NS 02367-06 (SN)
INTERFERON	9008-11-1	IMMUNOLOGIC TOXICITY	B	INFECTIOUS DISEASES BRANCH Z01 NS 01983-12 (ID)
IN VITRO NEUROTOXICITY		NEUROLOGIC/BEHAVIORAL TOXICITY	B	LAB. NEUROPHYSIOLOGY/Z01 NS 02019-12 LNP
ISOPROTERENOL	7683-59-2	BIOCHEMICAL/CELLULAR/TISSUE EFFECTS	B	DEVELOPMENTAL METABOLIC NEUROLOGY BRANCH Z01 NS 02366-06 (DMN)

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TOXICOLOGY TESTING

NATIONAL INSTITUTE OF NEUROLOGICAL AND COMMUNICATIVE DISORDERS AND STROKE
INTRAMURAL PROGRAM

CHEMICAL	CAS NO.	TEST TYPE	STATUS	PERFORMING ORGANIZATION/PROJECT NO.
KAINIC ACID	487-79-6	NEUROLOGIC/BEHAVIORAL TOXICITY	B	LAB. NEURO-OTOLARYNGOLOGY Z01 NS 02216-09 LNO
KAINIC ACID	487-79-6	NEUROLOGIC/BEHAVIORAL TOXICITY	B	NEUROTOXICOLOGY SECTION Z01 NS 02264-08 (LENP)
LEAD	7439-92-1	NEUROLOGIC/BEHAVIORAL TOXICITY	B	NEUROTOXICOLOGY SECTION Z01 NS 02264-08 (LENP)
MANGANESE	7439-96-5	NEUROLOGIC/BEHAVIORAL TOXICITY	B	NEUROTOXICOLOGY SECTION Z01 NS 02264-08 (LENP)
METHOTREXATE WITH ANTIBIOTICS WITH INTERFERON WITH HALOALKYLAMINES	59-05-2 9008-11-1	BIOCHEMICAL/CELLULAR/TISSUE EFFECTS	B	SURGICAL NEUROLOGY BRANCH/Z01 NS 02367-06
NEOMYCIN	1404-04-2	SYSTEMIC/ORGAN TOXICITY	B	COMMUNICATIVE DISORDERS PROGRAM Z01 NS 02471-04 (CDP)
NEUROPHARMACOLOGICAL AGENTS WITH ANTICONVULSANTS		NEUROLOGIC/BEHAVIORAL TOXICITY	B	MEDICAL NEUROLOGY BRANCH Z01 NS 02318-07 (MNB)
NEUROPHARMACOLOGICAL AGENTS WITH NEUROTOXINS WITH DOPAMINE WITH PROBENECID	51-61-6 57-66-9	BIOCHEMICAL/CELLULAR/TISSUE EFFECTS	B	EXPERIMENTAL THERAPEUTICS BRANCH Z01 NS 02139-10 (ET)
NEUROTOXINS		BIOCHEMICAL/CELLULAR/TISSUE EFFECTS	B	DEVEL. AND METAB. NEUROLOGY BRANCH ENZYMOLOGY AND GENETICS SECT./ Z01 NS 02529-03 (DMN)
NEUROTOXINS		BIOCHEMICAL/CELLULAR/TISSUE EFFECTS	B	LAB. OF BIOPHYSICS/Z01 NS 01950-13 (LB)
PHENOBARBITAL WITH ANTICONVULSANTS WITH CARBAMAZEPINE	50-06-6 298-46-4	NEUROLOGIC/BEHAVIORAL TOXICITY	B	MEDICAL NEUROLOGY BRANCH/ Z01 NS 02236-09 (MNB)
PHENOBARBITAL WITH PYRIMIDINE	50-06-6 289-95-2	NEUROLOGIC/BEHAVIORAL TOXICITY	B	OFFICE OF BIOMETRY AND FIELD STUDIES/ Z01 NS 02444-05 (OBFS)
CIS-PLATINUM COMPOUNDS		NEUROLOGIC/BEHAVIORAL TOXICITY	B	COMMUNICATIVE DISORDERS PROGRAM/ Z01 NS 02336-07
QUINIDINE	56-54-2	BIOCHEMICAL/CELLULAR/TISSUE EFFECTS	B	LAB. BIOPHYSICS/Z01 NS 02088-11 LB
SECOBARBITAL WITH SCOPOLAMINE	76-73-3 51-34-3	NEUROLOGIC/BEHAVIORAL TOXICITY	B	DEVELOPMENTAL NEUROLOGY BRANCH Z01 NS 02169-10(DNB)

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230<

NATIONAL INSTITUTE OF NEUROLOGICAL AND COMMUNICATIVE DISORDERS AND STROKE
INTRAMURAL PROGRAM

CHEMICAL	CAS NO.	TEST TYPE	STATUS	PERFORMING ORGANIZATION/PROJECT NO.
STREPTOZOCIN	18883-66-4	BIOCHEMICAL/CELLULAR/TISSUE EFFECTS	B	LAB. NEUROCHEM./Z01 NS 02256-08 (LET) (EXPERIMENTAL THERAPEUTICS BRANCH)
TERATOGENIC AGENTS				
WITH DIPHENYLHYDANTOIN	57-41-0			
WITH VALPROIC ACID	99-66-1	PHARMACOKINETICS/METABOLISM	B	LABORATORY OF MOLECULAR BIOLOGY Z01 NS 02365-06 (LMB)
TERATOGENIC AGENTS		BIOCHEMICAL/CELLULAR/TISSUE EFFECTS	B	INFECTIOUS DISEASES BRANCH/ Z01 NS 00972-13 (ID)

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TOXICOLOGY TESTING

NATIONAL INSTITUTE OF NEUROLOGICAL AND COMMUNICATIVE DISORDERS AND STROKE
EXTRAMURAL PROGRAM

CHEMICAL	CAS NO.	TEST TYPE	STATUS	PERFORMING ORGANIZATION/PROJECT NO.
ACETYLCHOLINE	51-84-3			
ACETYLCHOLINE	51-84-3	BIOCHEMICAL/CELLULAR/TISSUE EFFECTS	A	MASSACHUSETTS GEN. HOSP./P50 NS 10828-10
WITH HEAVY METALS				
WITH CADMIUM (COMPOUNDS)				
WITH NEUROTOXINS				
WITH CALCIUM	7440-20-2			
ACETYLCHOLINE	51-84-3	BIOCHEMICAL/CELLULAR/TISSUE EFFECTS	A	UNIV. OF CINCINNATI/R01 NS 17968-03
WITH NEUROTOXINS				
WITH VENOMS				
ACRYLAMIDES		BIOCHEMICAL/CELLULAR/TISSUE EFFECTS	A	ROCKEFELLER UNIV./R01 NS 18354-03
WITH TETANUS TOXIN				
WITH NEUROTOXINS				
ACRYLAMIDES		CLINICAL TOXICOLOGY/EPIDEMIOLOGY	A	JOHNS HOPKINS UNIVERSITY/R01 NS 10580-10
WITH TRITIUM	10028-17-8			
WITH NEUROTOXINS				
ADENINE NUCLEOTIDES		BIOCHEMICAL/CELLULAR/TISSUE EFFECTS	A	INSTITUTE FOR BASIC RESEARCH IN DEVELOPMENTAL DISABILITIES/ R01 NS 16546-03
AIR POLLUTANTS		CHRONIC TOXICITY	B	UNIV. OF COLORADO, DENVER/5P50 NS 09199-14
WITH FORMALDEHYDE	50-00-0			
WITH CARBON	7440-44-0			
ALCOHOL	64-17-5	NEUROLOGIC/BEHAVIORAL TOXICITY	A	UNIVERSITY OF CONNECTICUT/P50 NS 16993-03
ALLETHRIN	584-79-2	NEUROLOGIC/BEHAVIORAL TOXICITY	B	UNIV. OF PENNSYLVANIA/P50 NS 08075-14
AMIDES		CHRONIC TOXICITY	B	NORTHWESTERN UNIV., CHICAGO R01 NS 14143-08
ACRYLAMIDES				
GAMMA-AMINOBUTYRIC ACID				
NEUROTOXINS				
AMINOGLYCOSIDE ANTIBIOTICS		BIOCHEMICAL/CELLULAR/TISSUE EFFECTS	B	MEDICAL COLLEGE OF GEORGIA/5R23NS18664-02 AUGUSTA, GA.
GENTAMYCIN	1403-66-3			
KANAMYCIN	59-01-8			
NEOMYCIN	1404-04-2			
STREPTOMYCIN	57-92-1			
TOBRAMYCIN	32986-56-4			
AMINOGLYCOSIDE ANTIBIOTICS		BIOCHEMICAL/CELLULAR/TISSUE EFFECTS	A	UNIV. OF MICHIGAN, ANN ARBOR/ 2P01 NS05785-19

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TOXICOLOGY TESTING

NATIONAL INSTITUTE OF NEUROLOGICAL AND COMMUNICATIVE DISORDERS AND STROKE
EXTRAMURAL PROGRAM

233<

CHEMICAL	CAS NO.	TEST TYPE	STATUS	PERFORMING ORGANIZATION/PROJECT NO.
WITH DIURETICS		NEUROLOGIC/BEHAVIORAL TOXICITY	A	OREGON HEALTH SCIENCES UNIVERSITY P01 NS 16986-03
AMINOPYRIDINES		CHRONIC TOXICITY	B	NORTHWESTERN UNIV., CHICAGO R01 NS 14144-08
AMMONIA	7664-41-7	BIOCHEMICAL/CELLULAR/TISSUE EFFECTS	A	UNIVERSITY OF TEXAS HEALTH SCIENCE CENTER HOUSTON/R01 NS 17130-03
AMMONIA	7664-41-7	BIOCHEMICAL/CELLULAR/TISSUE EFFECTS	A	SLOAN-KETTERING INSTITUTE/R01 NS 15665-05
ANTHOPLEURIN-A	60880-63-9	CHRONIC TOXICITY	B	NORTHWESTERN UNIV., CHICAGO R01 NS 14144-08
ANTIBIOTICS		PHARMACOKINETICS/METABOLISM	B	HARVARD UNIV., BOSTON/R01 NS 12108-09
ANTIBIOTICS WITH DIURETICS		CLINICAL TOXICOLOGY/EPIDEMIOLOGY	B	UNIVERSITY OF MINNESOTA OF MNPLS-ST. PAUL P50 NS 12125-09
ANTIBIOTICS, ENDOTOXINS		NEUROLOGIC/BEHAVIORAL TOXICITY	A	PENNSYLVANIA STATE UNIVERSITY HERSHEY MEDICAL CENTER/R23 NS 18039-03
APOMORPHINE	58-00-4	CHRONIC TOXICITY	B	UNIV. OF COLORADO, DENVER/5P50 NS 09199-14
ATP	56-65-5	PHARMACOKINETICS/METABOLISM	B	UNIV. OF NEBRASKA MED. CTR., OMAHA R01 NS 15187-05
AZACHOLESTEROL COMPOUNDS		NEUROLOGIC/BEHAVIORAL TOXICITY	B	UNIV. OF PENNSYLVANIA/P50 NS 08075-14
BACTERIAL ENDOTOXIN		BIOCHEMICAL/CELLULAR/TISSUE EFFECTS	B	UNIV. OF CALIF., SAN FRANCISCO P01 NS 14543-06
BARBITURATES		BIOCHEMICAL/CELLULAR/TISSUE EFFECTS	B	UNIV. OF CALIF., SAN FRANCISCO P01 NS 14543-06
BICUCULLINE	485-49-4	PHARMACOKINETICS/METABOLISM	A	SOUTHERN ILLINOIS UNIV. SCHOOL OF MEDICINE SPRINGFIELD, ILLINOIS R01 NS 13849-0351
BIS-(THIOACETOXYL)AURATE(I)		CHRONIC TOXICITY	B	UNIV. OF PENNSYLVANIA/R01 NS 00282-32A1
BOTULINUM TOXIN WITH TETANUS TOXIN		CHRONIC TOXICITY	B	UNIV. OF CALIFORNIA, LOS ANGELES R01 NS 12873-07A2
BOTULINUM TOXIN		CHRONIC TOXICITY	B	COLUMBIA UNIV., NEW YORK/R01 NS 15409-05
BROMOCRIPTINE	25614-03-3	PHARMACOKINETICS/METABOLISM	B	UNIV. OF TORONTO, TORONTO/R01 NS 09839-13
BUNGAROTOXIN	37209-28-2	BIOCHEMICAL/CELLULAR/TISSUE EFFECTS	A	UNIVERSITY OF CONNECTICUT HEALTH CENTER R01 NS 13860-06
BUNGAROTOXIN	37209-28-2	NEUROLOGIC/BEHAVIORAL TOXICITY	B	UNIVERSITY OF ILLINOIS MEDICAL CENTER R01 NS 16259-05
BUNGAROTOXIN	37209-28-2	BIOCHEMICAL/CELLULAR/TISSUE EFFECTS	B	COLUMBIA UNIVERSITY/P01 NS 11766-10
BUNGAROTOXIN WITH GLUCOCORTOIDS WITH CATECHOLAMINES	37209-28-2	CLINICAL TOXICOLOGY/EPIDEMIOLOGY	B	HARVARD UNIV., BOSTON/R01 NS 12651-09
BETA-BUNGAROTOXIN	12778-32-4	CHRONIC TOXICITY	B	UNIV. OF CALIFORNIA, LOS ANGELES R01 NS 12873-07A2
CALCIUM WITH BUNGAROTOXIN	7440-70-2 37209-28-2			

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TOXICOLOGY TESTING

NATIONAL INSTITUTE OF NEUROLOGICAL AND COMMUNICATIVE DISORDERS AND STROKE
EXTRAMURAL PROGRAM

CHEMICAL	CAS NO.	TEST TYPE	STATUS	PERFORMING ORGANIZATION/PROJECT NO.
WITH TETRODOTOXIN	4368-28-9	BIOCHEMICAL/CELLULAR/TISSUE EFFECTS	A	SALK INST., LA JOLLA, CALIF. R01 NS 11918-09
CARBACHOL	51-83-2	PHARMACOKINETICS/METABOLISM	B	WASHINGTON UNIV., ST. LOUIS R01 NS 12311-09
CARBAMAZEPINE	298-46-4	NEUROLOGIC/BEHAVIORAL TOXICITY	A	UNIV. OF CALIF., LOS ANGELES P01 NS 02808-23
CARBAMAZEPINE	298-46-4			
WITH DIPHENYLHYDANTOIN	57-41-0	NEUROLOGIC/BEHAVIORAL TOXICITY	B	UNIV. OF MINNESOTA, MINNEAPOLIS, MINN. P50 NS 16308-04
CARBON	7440-44-0			
WITH ANTIBIOTICS (PENICILLIN)				
WITH TRITIUM	10028-17-8			
WITH NERUOPHARMACOLOGICAL AGENTS (ANTICONVULSANTS)				
WITH DOPAMINE	51-61-6			
WITH NOREPINEPHRINE	51-41-2	BIOCHEMICAL/CELLULAR/TISSUE EFFECTS		WASHINGTON UNIV., ST. LOUIS/ P01 NS 14834-06
CEPHEMS		PHARMACOKINETICS/METABOLISM	B	HARVARD UNIV., BOSTON/R01 NS 12108-09
CHIRIQUITOXIN	61132-15-8	CHRONIC TOXICITY	B	DOWNSTATE MEDICAL CENTER, NEW YORK R01 NS 14551-05
CHLORPROMAZINE	50-53-3	BIOCHEMICAL/CELLULAR/TISSUE EFFECTS	A	UNIV. OF PENNSYLVANIA/P50 NS 10939-12
CHOLERA TOXIN		BIOCHEMICAL/CELLULAR/TISSUE EFFECTS	B	UNIV. OF MISSOURI, COLUMBIA/ R01 NS 18712-02
CHOLESTEROL	57-88-5			
WITH ACRYLAMIDE	79-06-1			
WITH PYRIMIDINES		BIOCHEMICAL/CELLULAR/TISSUE EFFECTS	B	MAYO FOUNDATION/P01 NS 14304-06
CHOLESTEROL	57-88-5			
WITH NEUROPHARMACOLOGICAL AGENTS		PHARMACOKINETICS/METABOLISM	A	INSTITUTE FOR BASIC RES. IN DEV. DISABIL. (NEW YORK STATE INSTITUTE)
CHOLESTEROL	57-88-5			
WITH DIPHENYLHYDANTOIN	57-41-0			
WITH CAFFEINE	58-08-2	BIOCHEMICAL/CELLULAR/TISSUE EFFECTS	A	UNIV. OF PENNSYLVANIA, PHILADELPHIA R01 NS 18209-03
COLCHICINE	64-86-8	PHARMACOKINETICS/METABOLISM	B	UNIV. OF CALIFORNIA, SANTA BARBARA R01 NS 13560-08
COLCHICINE	64-86-8			
WITH MYCOTOXINS				

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TOXICOLOGY TESTING

NATIONAL INSTITUTE OF NEUROLOGICAL AND COMMUNICATIVE DISORDERS AND STROKE
EXTRAMURAL PROGRAM

235<

CHEMICAL	CAS NO.	TEST TYPE	STATUS	PERFORMING ORGANIZATION/PROJECT NO.
WITH CYTOCHALASIN	37187-49-8	BIOCHEMICAL/CELLULAR/TISSUE EFFECTS	B	UNIVERSITY OF TEXAS AUSTIN/R01 NS 16072-05
COLCHICINE	64-86-8			
WITH MYCOTOXINS				
WITH CYTOCHALASIN	37187-49-8	BIOCHEMICAL/CELLULAR/TISSUE EFFECTS	A	UNIVERSITY OF UTAH/R01 NS 18112-03
CYCLIC AMP	60-92-4	CHRONIC TOXICITY	B	UNIV. OF COLORADO, DENVER/5P50 NS 09199-14
CYCLOPHOSPHAMIDE	50-18-0			
WITH 6-MERCAPTOPURINE	50-44-2			
WITH AZATHIOPRINE	446-86-6	NEUROLOGIC/BEHAVIORAL TOXICITY	A	UNIV. OF CALIFORNIA AT LOS ANGELES P01 NS 08711-13
DDT	50-29-3	CHRONIC TOXICITY	B	NORTHWESTERN UNIV., CHICAGO R01 NS 14143-08
DEANOL ACETAMIDOBENZOATE	3635-74-3	BIOCHEMICAL/CELLULAR/TISSUE EFFECTS	A	UNIV. OF TEXAS, GALVESTON/P01 NS 07377-14
DEMECOLCINE	477-30-5			
WITH DIAZEPAM	439-14-5			
WITH CYTOCHALASIN	37187-49-8			
WITH MYCOTOXINS		BIOCHEMICAL/CELLULAR/TISSUE EFFECTS	A	RUTGERS MED. SCHOOL, NEWARK, N.J. R01 NS 11299-09
DEMETON	8065-48-3	CHRONIC TOXICITY	B	NORTHWESTERN UNIV., CHICAGO R01 NS 14143-08
DEOXYGLUCOSE				
WITH HEAVY METALS				
WITH ZINC COMPOUNDS				
WITH NEUROTOXINS				
WITH CARBON	7440-44-0	BIOCHEMICAL/CELLULAR/TISSUE EFFECTS	A	UNIV. OF CONNECTICUT, STORRS P01 NS 16993-03
DIAZACHOLESTEROL	313-05-3	CHRONIC TOXICITY	A	UNIV. OF CINCINNATI/R01 NS 03178-20
20,25-DIAZACHOLESTEROL	313-05-3	NEUROLOGIC/BEHAVIORAL TOXICITY	B	UNIV. OF PENNSYLVANIA/P50 NS 08075-14
DIAZEPAM	439-14-5	NEUROLOGIC/BEHAVIORAL TOXICITY	A	UNIV. OF CALIF., LOS ANGELES P01 NS 02808-23
DICHLOROBENZOIC ACIDS		NEUROLOGIC/BEHAVIORAL TOXICITY	B	UNIV. OF PENNSYLVANIA/P50 NS 08075-14
2,4-DICHLOROPHENOXYACETATE		NEUROLOGIC/BEHAVIORAL TOXICITY	B	UNIV. OF PENNSYLVANIA/P50 NS 08075-14
5,6-DIHYDROXYTRYPTAMINE	5090-36-8	CHRONIC TOXICITY	B	UNIV. OF PENNSYLVANIA/R01 NS 12211-09
DIPHENYLHYDANTOIN	57-41-0			
WITH NEUROPHARMACOLOGICAL AGENTS				
WITH ANTICONVULSANTS				
DIPHENYLHYDANTOIN	57-41-0	NEUROLOGIC/BEHAVIORAL TOXICITY	B	UNIVERSITY OF MINNESOTA/P50 NS 16308-04
WITH NEUROPHARMACOLOGICAL AGENTS				
WITH ANTICONVULSANTS		IMMUNOLOGIC TOXICITY	A	COLUMBIA UNIVERSITY/R01 NS 18324-03
DIPHTHERIA TOXINS		NEUROLOGIC/BEHAVIORAL TOXICITY	B	UNIV. OF PENNSYLVANIA/P50 NS 08075-14
DIPROPYLACETIC ACID	99-66-1	NEUROLOGIC/BEHAVIORAL TOXICITY	A	YALE UNIV./P50 NS 06208-18
DIPYRIDAMOLE	58-32-2	BIOCHEMICAL/CELLULAR/TISSUE EFFECTS SYSTEMIC/ORGAN TOXICITY	B	DUKE VETERANS ADMIN. CTR./P50 NS 06233-19

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TOXICOLOGY TESTING

NATIONAL INSTITUTE OF NEUROLOGICAL AND COMMUNICATIVE DISORDERS AND STROKE
EXTRAMURAL PROGRAM

CHEMICAL	CAS NO.	TEST TYPE	STATUS	PERFORMING ORGANIZATION/PROJECT NO.
DNP-LYSINE				
DOPA	59-92-7	CHRONIC TOXICITY	B	UNIV. OF PUERTO RICO/P01 NS 07464-17
DOPA	59-92-7		B	UNIV. OF COLORADO, DENVER/5P50 NS 09199-14
WITH TYRAMINE				
WITH CARBON	7440-44-0	BIOCHEMICAL/CELLULAR/TISSUE EFFECTS	A	MAYO FOUNDATION/R01 NS 09143-11
DOPAMINE	51-61-6	BIOCHEMICAL/CELLULAR/TISSUE EFFECTS	A	MASSACHUSETTS GEN. HOSP./P50 NS 10828-10
EA RESIN	30999-33-8	NEUROLOGIC/BEHAVIORAL TOXICITY	A	UNIV. OF OREGON, PORTLAND/R01 NS 12808-06
ETHACRYNIC ACID	58-54-8	BIOCHEMICAL/CELLULAR/TISSUE EFFECTS	A	UNIV. OF TEXAS, GALVESTON/P01 NS 07377-14
GAMMA-AMINOBUTYRIC ACID				
NEUROPHARMACOLOGICAL AGENTS				
ANTICONVULSANTS		BIOCHEMICAL/CELLULAR/TISSUE EFFECTS	B	YALE UNIV./1R01 NS19655-01
GEPHYROTOXIN	55893-12-4	PHARMACOKINETICS/METABOLISM	B	HARVARD UNIV., BOSTON/R01 NS 12108-09
GLIOTOXINS		PHARMACOKINETICS/METABOLISM	B	HARVARD UNIV., BOSTON/R01 NS 12108-09
GONYAUTOXINS	35554-08-6	PHARMACOKINETICS/METABOLISM	B	HARVARD UNIV., BOSTON/R01 NS 12108-09
GRAYANOTOXIN	1399-60-6	CHRONIC TOXICITY	B	NORTHWESTERN UNIV.,CHICAGO/R01 NS 14144-08
GRISEOFULVIN	126-07-8	PHARMACOKINETICS/METABOLISM	A	UNIV. OF CALIFORNIA, SANTA BARBARA R01 NS 13560-08
HALOBENZENES		NEUROLOGIC/BEHAVIORAL TOXICITY	B	UNIV. OF CALIFORNIA, LA JOLLA 2R01 NS 14162-07
HALOTHANE	151-67-7	BIOCHEMICAL/CELLULAR/TISSUE EFFECTS	B	UNIV. OF CALIF., SAN FRANCISCO P01 NS 14543-06
HALOTHANE	151-67-7			
WITH NEUROTOXINS		NEUROLOGIC/BEHAVIORAL TOXICITY	A	IOWA STATE UNIVERSITY/R01 NS 17107-03
HEXACHLOROPHENE	70-30-4	NEUROLOGIC/BEHAVIORAL TOXICITY	B	UNIV. OF CALIFORNIA, LA JOLLA 2R01 NS 14162-07
HISTAMINE	51-45-6	BIOCHEMICAL/CELLULAR/TISSUE EFFECTS	B	UNIV. OF PUERTO RICO/P01 NS 07464-17
HYDROCARBON				
WITH HEAVY METALS				
WITH CIS PLATINUM COMPOUNDS				
WITH NEUROTOXINS		BIOCHEMICAL/CELLULAR/TISSUE EFFECTS	B	JOHNS HOPKINS HOSP./P01 NS 15721-05
6-HYDROXYDOPAMINE	1199-18-4	CHRONIC TOXICITY	B	UNIV. OF PENNSYLVANIA/R01 NS 12211-09
KAINIC ACID	487-79-6	NEUROLOGIC/BEHAVIORAL TOXICITY	B	JOHNS HOPKINS UNIV./R01 NS 13584-08
LASALOCIDS	11054-70-9	PHARMACOKINETICS/METABOLISM	B	HARVARD UNIV., BOSTON/R01 NS 12108-09
LEAD	7439-92-1			
WITH METHYL MERCURY	22967-92-6			
WITH ARSENIC (COMPOUNDS)				
WITH DOPAMINE	51-61-6			
WITH HEAVY METALS				

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237<

TOXICOLOGY TESTING

NATIONAL INSTITUTE OF NEUROLOGICAL AND COMMUNICATIVE DISORDERS AND STROKE
EXTRAMURAL PROGRAM

CHEMICAL	CAS NO.	TEST TYPE	STATUS	PERFORMING ORGANIZATION/PROJECT NO.
WITH NEUROTOXINS		NEUROLOGIC/BEHAVIORAL TOXICITY	B	MAYO FOUNDATION, ROCHESTER, MINN. P01 NS 14304-06
LIPID SOLUBLE DRUGS		PHARMACOKINETICS/METABOLISM	A	UNIV. OF WASHINGTON, SEATTLE R01 NS 08174-16
LOCAL ANESTHETICS		PHARMACOKINETICS/METABOLISM	A	UNIV. OF WASHINGTON, SEATTLE R01-NS-08174-16
MAGNESIUM	7439-95-4	PHARMACOKINETICS/METABOLISM	A	UNIV. OF NEBRASKA MED. CTR., OMAHA R01 NS 15187-04A1
MAGNESIUM PEMOLINE	18968-99-5	BIOCHEMICAL/CELLULAR/TISSUE EFFECTS	A	UNIV. OF TEXAS, GALVESTON/P01 NS 07377-14
METALS HEAVY METALS TIN NEUROTOXINS TETRODOTOXIN	 7440-31-5 4368-28-9	BIOCHEMICAL/CELLULAR/TISSUE EFFECTS	B	INDIANA UNIVERSITY/2R01NS18125-02A2 BLOOMINGTON, INDIANA
METHYL DEMETON	8022-00-2	CHRONIC TOXICITY	B	NORTHWESTERN UNIV., CHICAGO R01 NS 14143-08
METHYLPHENIDATE METHYLPREDNISOLONE	113-45-1 83-43-2	BIOCHEMICAL/CELLULAR/TISSUE EFFECTS	A	UNIV. OF TEXAS, GALVESTON/P01 NS 07377-13S1
WITH NALOXONE	465-65-6	CLINICAL TOXICOLOGY/EPIDEMIOLOGY	A	NEW YORK UNIV. MED. CTR., N.Y. P50 NS 10164-12
METRAZOLE	54-95-5	NEUROLOGIC/BEHAVIORAL TOXICITY	A	UNIV. OF CALIF., LOS ANGELES P01 NS 02808-23
MORPHINE	57-27-2	BIOCHEMICAL/CELLULAR/TISSUE EFFECTS	B	UNIV. OF CALIF., SAN FRANCISCO P01 NS 14543-06
NEUROPHARMACOLOGY NEUROTOXINS CATECHOLAMINES		BIOCHEMICAL/CELLULAR/TISSUE EFFECTS	A	MICHIGAN STATE UNIVERSITY/5R0109174-19 EAST LANSING, MICHIGAN
NEUROPHARMACOLOGICAL AGENTS WITH ANESTHETICS, LOCAL NEUROTOXINS PROCAINE HYDROCHLORIDE CLOROPROCAINE PHENYLAMIDES LIDOCAINE CATECHOLAMINES EPINEPHRINE SULFITES	 137-58-6 51-43-4 	PHARMACOKINETICS/METABOLISM	B	UNIVERSITY OF CALIFORNIA,SAN DIEGO R01 NS1871501A1
NEUROPHARMACOLOGICAL AGENTS ANTICONVULSANTS HYDANTOINS DIPHENYLHYDANTOIN	 57-41-0			

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TOXICOLOGY TESTING

NATIONAL INSTITUTE OF NEUROLOGICAL AND COMMUNICATIVE DISORDERS AND STROKE
EXTRAMURAL PROGRAM

CHEMICAL	CAS NO.	TEST TYPE	STATUS	PERFORMING ORGANIZATION/PROJECT NO.
BARBITURATES PHENOBARBITAL	50-06-6	BIOCHEMICAL/CELLULAR/TISSUE EFFECTS	B	UNIVERSITY OF PENNSYLVANIA/1R01NS19297-01
NEUROPHARMACOLOGICAL AGENTS ANTICONVULSANTS		BIOCHEMCIAL/CELLULAR/TISSUE EFFECTS	B	HAZLETON LABORATORIES CORPORATION, VIENNA, VA/ 5N01 NS32358
NEUROPHARMACOLOGICAL AGENTS NEUROTOXINS		BIOCHEMICAL/CELLULAR/TISSUE EFFECTS	B	UNIVERSITY OF UTAH, SALT LAKE CITY, UTAH/ 1N01 NS42361
NEUROPHARMACOLOGICAL AGENTS WITH NEUROTOXINS WITH CARBON	7440-44-0	NEUROLOGIC/BEHAVIORAL TOXICITY	A	MAYO CLINIC AND FOUNDATION/R01 NS 18170-03
NEUROPHARMACOLOGICAL AGENTS WITH ANTICONVULSANTS		CLINICAL TOXICOLOGY/EPIDEMIOLOGY	B	UNIVERSITY OF MINNESOTA OF MNPLS-ST. PAUL P50 NS 16308-04
NEUROPHARMACOLOGICAL AGENTS WITH ANESTHETICS, LOCAL WITH NEUROTOXINS		PHARMACOKINETICS/METABOLISM	A	UNIVERSITY OF MISSISSIPPI MEDICAL CENTER R01 NS 16462-03
NEUROPHARMACOLOGICAL AGENTS WITH ANESTHETICS		BIOCHEMICAL/CELLULAR/TISSUE EFFECTS	A	PENNSYLVANIA STATE UNIVERSITY HERSHEY MEDICAL CENTER/R01 NS 16737-03
NEUROPHARMACOLOGICAL AGENTS WITH ANTICONVULSANTS		CLINICAL TOXICOLOGY/EPIDEMIOLOGY	A	UNIVERSITY OF WASHINGTON/P50 NS17111-03
NEUROPHARMACOLOGICAL AGENTS WITH ANTICONVULSANTS WITH CONVULSANTS WITH NEUROTOXINS		BIOCHEMICAL/CELLULAR/TISSUE EFFECTS	A	DUKE UNIV.-VETERANS ADMIN. HOSP., DURHAM, NC/P01 NS 17771-03
NEUROPHARMACOLOGICAL AGENTS WITH ANTICONVULSANTS WITH CENTRALLY ACTING DRUGS		PHARMACOKINETICS/METABOLISM	B	UNIV. OF ARIZONA/R01 NS 15441-05S1
NEUROPHARMACOLOGICAL AGENTS WITH NEUROTOXINS WITH L-HYDROXYDOPAMINE		NEUROLOGIC/BEHAVIORAL TOXICITY	A	UNIV. OF TEXAS, AUSTIN/R01 NS 17274-07S1
NEUROPHARMACOLOGICAL AGENTS WITH NEUROTOXINS WITH TETRODOTOXIN	4368-28-9			

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238<

TOXICOLOGY TESTING

NATIONAL INSTITUTE OF NEUROLOGICAL AND COMMUNICATIVE DISORDERS AND STROKE
EXTRAMURAL PROGRAM

CHEMICAL	CAS NO.	TEST TYPE	STATUS	PERFORMING ORGANIZATION/PROJECT NO.
WITH SAXITOXIN	35523-89-8	BIOCHEMICAL/CELLULAR/TISSUE EFFECTS	A	YALE UNIV. SCHOOL OF MEDICINE/ R01 NS 17928-03
NEUROTOXINS GAMMA-AMINOBUTYRIC ACID BENZODIAZEPINES CHOLINE ACETYLCHOLINE	51-84-3	BIOCHEMIAL/CELLULAR /TISSUE EFFECTS	B	JOHNS HOPKINS UNIVERSITY/5K07NS00799-02 BALTIMORE, MARYLAND
NEUROTOXINS TETRODOTOXIN SAXITOXIN	 4368-28-9 35523-89-8	MUTAGENESIS/GENETIC TOXICITY	A	ALBERT EINSTEIN COLLEGE OF MEDICINE/ 5R01NS16204-06 BRONX, NEW YORK
NEUROTOXINS		BIOCHEMICAL/CELLULAR/TISSUE EFFECTS	B	UNIVERSITY OF ALABAMA, BIRMINGHAM/ R01NS19183-01A1
NEUROTOXINS			B	WAYNE STATE UNIVERSITY,DETROIT, MICHIGAN/ 1R01NS19519-01A1
NEUROTOXINS CYANIDES AMIDES, ACRYLAMIDES ANTIBIOTICS, ADRIAMYCIN	23214-92-8	BIOCHEMICAL/CELLULAR/TISSUE EFFECTS	B	YESHIVA UNIVERSITY, NEW YORK, NY/ 1P01NS19611-01
NEUROTOXINS QUINOLINES		BIOCHEMICAL/CELLULAR/TISSUE EFFECTS	B	VANDERBILT UNIVERSITY, NASHVILLE, TN/ 2R01NS20509-02
NEUROTOXINS		PHARMACOKINETICS/METABOLISM	B	HARVARD UNIV., BOSTON/R01 NS 12108-09
NEUROTOXINS WITH ACETYLCHOLINE	51-84-3	BIOCHEMICAL/CELLULAR/TISSUE EFFECTS	B	UNIVERSITY OF ARIZONA/R01 NS 16047-05
NEUROTOXINS		CHRONIC TOXICITY	B	UNIVERSITY OF ROCHESTER/R01 NS 16147-05
NEUROTOXINS WITH BUNGAROTOXIN	37209-28-2	BIOCHEMICAL/CELLULAR/TISSUE EFFECTS	B	COLUMBIA UNIVERSITY/P01 NS 11766-10
NEUROTOXINS		CLINICAL TOXICOLOGY/EPIDEMIOLOGY	A	UNIVERSITY OF MARYLAND AT BALTIMORE R01 NS 12063-10
NEUROTOXINS WITH BUNGAROTOXIN	37209-28-2	BIOCHEMICAL/CELLULAR/TISSUE EFFECTS	B	UNIVERSITY OF CALIFORNIA SAN DIEGO R01 NS 12601-09
NEUROTOXINS		IMMUNOLOGIC TOXICITY	B	COLUMBIA UNIVERSITY/R01 NS 15581-05
NEUROTOXINS		BIOCHEMICAL/CELLULAR/TISSUE EFFECTS	B	UNIVERSITY OF KANSAS COL. HLTH. SCI. & HOSP./R01 NS 17252-04
NEUROTOXINS		NEUROLOGIC/BEHAVIORAL TOXICITY	A	UNIVERSITY OF MINNESOTA OF MNPLS-ST. PAUL R01 NS 16567-04
NEUROTOXINS NEUROTOXINS WITH SODIUM	 17341-25-2	BIOCHEMICAL/CELLULAR/TISSUE EFFECTS	B	UNIVERSITY OF FLORIDA/R01 NS 18268-03

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TOXICOLOGY TESTING

NATIONAL INSTITUTE OF NEUROLOGICAL AND COMMUNICATIVE DISORDERS AND STROKE
EXTRAMURAL PROGRAM

CHEMICAL	CAS NO.	TEST TYPE	STATUS	PERFORMING ORGANIZATION/PROJECT NO.
WITH VENOMS		BIOCHEMICAL/CELLULAR/TISSUE EFFECTS	B	UNIV. OF MARYLAND AT BALTIMORE R01 NS 16285-04A1
NEUROTOXINS		BIOCHEMICAL/CELLULAR/TISSUE EFFECTS	A	METHODIST HOSP., HOUSTON/R01 NS 14907-06
NEUROTOXINS		NEUROLOGIC/BEHAVIORAL TOXICITY	B	UNIV. OF ARKANSAS, LITTLE ROCK/ R01 NS 04761-21
NEUROTOXINS WITH CARBON		BIOCHEMICAL/CELLULAR/TISSUE EFFECTS	B	UNIV. OF CINCINNATI/R01 NS 14368-05
NEUROTOXINS WITH VENOM		BIOCHEMICAL/CELLULAR/TISSUE EFFECTS	A	DARTMOUTH MEDICAL SCHOOL, DEPT. OF BIOCHEMISTRY/R01 NS 18036-03
NEUROTOXINS WITH ACRYLAMIDE	79-06-1	BIOCHEMICAL/CELLULAR/TISSUE EFFECTS	B	MEDICAL COLLEGE OF GEORGIA/ R23 NS 18664-02
NEUROTOXINS WITH MYCOTOXINS		NEUROLOGIC/BEHAVIORAL TOXICITY	B	UNIV. OF CALIFORNIA, LOS ANGELES/ R01 NS 18255-02
NITROGLYCERIN	55-63-0	BIOCHEMICAL/CELLULAR/TISSUE EFFECTS	A	MASSACHUSETTS GEN. HOSP./P50 NS 10828-10
NOREPINEPHRINE	51-41-2	BIOCHEMICAL/CELLULAR/TISSUE EFFECTS	A	MASSACHUSETTS GEN. HOSP./P50 NS 10828-10
OLIGOMYCIN	1404-19-9	NEUROLOGIC/BEHAVIORAL TOXICITY	B	STANFORD UNIV./P50 NS 12151-09
OUABAIN	630-60-4			
WITH ACETYLCHOLINE	51-84-3			
WITH MAGNESIUM	7439-95-4			
WITH NEUROPHARMACOLOGICAL AGENTS				
WITH SODIUM	17341-25-2			
WITH TETRODOTOXIN	4368-28-9	BIOCHEMICAL/CELLULAR/TISSUE EFFECTS	A	MIRIAM HOSP., PROVIDENCE, R.I. R01 NS 16753-03
PALYTOXIN	11077-03-5	CHRONIC TOXICITY	B	NORTHWESTERN UNIV., CHICAGO R01 NS 14144-08
PARACHLOROPHENYLALANINE	1991-78-2	CHRONIC TOXICITY	B	UNIV. OF PENNSYLVANIA/R01 NS 12211-09
PENAMS		PHARMACOKINETICS/METABOLISM	B	HARVARD UNIV., BOSTON/R01 NS 12108-09
PENTYLENETETRAZOL	54-95-5	PHARMACOKINETICS/METABOLISM	A	SOUTHERN ILLINOIS UNIV. SCHOOL OF MEDICINE SPRINGFIELD, ILLINOIS R01 NS 13849-03S1
PENTYLENETETRAZOLE	54-95-5	NEUROLOGIC/BEHAVIORAL TOXICITY	B	STANFORD UNIV./P50 NS 12151-09
PERHYDROHISTRIONICOTOXIN	40709-29-3	PHARMACOKINETICS/METABOLISM	B	HARVARD UNIV., BOSTON/R01 NS 12108-09
PHENOBARBITAL	50-06-6	NEUROLOGIC/BEHAVIORAL TOXICITY	A	UNIV. OF CALIF., LOS ANGELES P01 NS 02808-23

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241<

TOXICOLOGY TESTING

NATIONAL INSTITUTE OF NEUROLOGICAL AND COMMUNICATIVE DISORDERS AND STROKE
EXTRAMURAL PROGRAM

CHEMICAL	CAS NO.	TEST TYPE	STATUS	PERFORMING ORGANIZATION/PROJECT NO.
PHENOXYBENZAMINE	59-96-1	PHARMACOKINETICS/METABOLISM	B	WASHINGTON UNIV., ST. LOUIS
				R01 NS 12311-09
PHENYTOIN	57-41-0	NEUROLOGIC/BEHAVIORAL TOXICITY	B	YALE UNIV./P50 NS 06208-18
PHOSPHOPROTEIN PHOSPHATASES		BIOCHEMICAL/CELLULAR/TISSUE EFFECTS	B	RUTGERS MED. SCH./R01 NS 11252-11
PHYSOSTIGMINE	57-47-6	PHARMACOKINETICS/METABOLISM	A	SOUTHERN ILLINOIS UNIV. SCHOOL OF MEDICINE
				SPRINGFIELD, ILLINOIS
				R01 NS 13849-03S1
PHYSOSTIGMINE	57-47-6	BIOCHEMICAL/CELLULAR/TISSUE EFFECTS	A	UNIV. OF TEXAS, GALVESTON/P01 NS 07377-14
PICROTOXIN	124-87-8			
WITH METHYL PREDNISOLONE	83-43-2			
WITH NEUROPHARMACOLOGICAL AGENTS		BIOCHEMICAL/CELLULAR/TISSUE EFFECTS	B	WASHINGTON UNIVERSITY/P01 NS 15070-05
PIMOZIDE	2062-78-4			
HALOPERIDOL	52-86-8	BIOCHEMICAL/CELLULAR/TISSUE EFFECTS	B	MT. SINAI SCHOOL OF MEDICINE, N.Y./
TRANQUILIZERS				1R01 NS20529-01
ANTI-PLATELET DRUGS		BIOCHEMICAL/CELLULAR/TISSUE EFFECTS		
		SYSTEMIC/ORGAN TOXICITY	B	DUKE VETERANS ADMIN. CTR./P50 NS 06233-19
PROCTOLIN	57966-42-4		B	UNIV. OF PUERTO RICO/P01 NS 07464-16
PROPANOL	71-23-8	BIOCHEMICAL/CELLULAR/TISSUE EFFECTS	A	UNIV. OF TEXAS, GALVESTON/P01 NS 07377-14
PROPRANOLOL	525-66-6			
WITH NEUROPHARMACOLGIC AGENTS				
WITH PHENOTHIAZINES	50-53-3			
(CHLORPROMAZINE)		BIOCHEMICAL/CELLULAR/TISSUE EFFECTS	B	MCLEAN HOSP., BELMONT, MASS./
				R01 NS 19047-02
PROSTAGLANDIN E1	745-65-3	BIOCHEMICAL/CELLULAR/TISSUE EFFECTS	B	JOHN B. PIERCE FDN. OF CONNECTICUT
				R01 NS 11487-10
PROSTAGLANDINS				
WITH INDOMETHACIN	53-86-1			
WITH PHENYLCARBOXYLATES				
WITH SALICYLATES		CHRONIC TOXICITY	B	UNIV. OF MINNESOTA, DEPT. OF
				OTOLARYNGOLOGY/P50 NS 14538-06
PYRIMIDINES				
WITH BARBITURATES	50-06-6			
(PHENOBARBITAL)		NEUROLOGIC/BEHAVIORAL TOXICITY	B	UNIV. OF WASHINGTON, SEATTLE/
				N01 NS 22395-03
QUINAZOLINONES		PHARMACOKINETICS/METABOLISM	B	VPI, BLACKSBURG, VIRGINIA/R01 NS 10197-08A2
QUINEBIDIMYL BENZILATE		BIOCHEMICAL/CELLULAR/TISSUE EFFECTS		
		SYSTEMIC/ORGAN TOXICITY	B	DUKE VETERANS ADMIN. CTR./P50 NS 06233-19
RAUWOLFIA ALKALOIDS		CHRONIC TOXICITY	B	UNIV. OF COLORADO, DENVER/5P50 NS 09199-14
RESERPINE	50-55-5	PHARMACOKINETICS/METABOLISM	B	UNIV. OF NEBRASKA MED. CTR., OMAHA
				R01 NS 15187-05
RESERPINE	50-55-5	CHRONIC TOXICITY	B	UNIV. OF PENNSYLVANIA/R01 NS 12211-09
SAXITOXIN	35523-89-8	PHARMACOKINETICS/METABOLISM	B	HARVARD UNIV., BOSTON/R01 NS 12108-09
SAXITOXIN	35523-89-8	CHRONIC TOXICITY	B	DOWNSTATE MEDICAL CENTER, NEW YORK

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TOXICOLOGY TESTING

NATIONAL INSTITUTE OF NEUROLOGICAL AND COMMUNICATIVE DISORDERS AND STROKE
EXTRAMURAL PROGRAM

CHEMICAL	CAS NO.	TEST TYPE	STATUS	PERFORMING ORGANIZATION/PROJECT NO.
				R01 NS 14551-05
SAXITOXIN	35523-89-8	CHRONIC TOXICITY	B	NORTHWESTERN UNIV., CHICAGO R01 NS 14144-08
SCOPOLAMINE	51-34-3	BIOCHEMICAL/CELLULAR/TISSUE EFFECTS	A	UNIV. OF PENNSYLVANIA/P50 NS 10939-12
SCORPION VENOM		PHARMACOKINETICS/METABOLISM	A	UNIV. OF WASHINGTON, SEATTLE R01 NS 08174-16
SEROTONIN	50-67-9	BIOCHEMICAL/CELLULAR/TISSUE EFFECTS	A	MASSACHUSETTS GEN. HOSP./P50 NS 10828-10
SEROTONIN WITH ACETYLCHOLINE WITH DOPAMINE WITH NEUROPHARMACOLOGICAL AGENTS WITH ADENINE NUCLEOTIDES	50-67-9 51-84-3 51-61-6	BIOCHEMICAL/CELLULAR/TISSUE EFFECTS	B	UNIV. OF ALABAMA, BIRMINGHAM P50 NS 08802-15
SEROTONIN WITH NEUROTOXINS WITH ENKEPHALIN WITH SOMATOSTATIN	50-67-9 59141-40-1 51110-01-1	BIOCHEMICAL/CELLULAR/TISSUE EFFECTS	A	OHIO ST. UNIV., COLUMBUS/R23 NS 17080-02
SEROTONIN WITH 5-HYDROXYTRYPTOPHANE WITH PHENOXYBENZAMINE WITH NEUROPHARMACOLOGICAL AGENTS WITH ANTICONVULSANTS	50-67-9 56-69-9 59-96-1	CLINICAL TOXICOLOGY/EPIDEMIOLOGY	B	MT. SINAI SCHOOL OF MED., N.Y.C. R01 NS 12341-08
SEROTONIN WITH DOPA WITH 5-HYDROXYTRYPTOPHAN WITH NEUROPHARMACOLIGICAL AGENTS WITH CARBON	50-67-9 59-92-7 56-69-9 7440-44-0	BIOCHEMICAL/CELLULAR/TISSUE EFFECTS	A	ALBERT EINSTEIN COLLEGE OF MEDICINE/ P50 NS 09649-13
SOMATOSTATIN WITH NEUROTOXINS	51110-01-1	CHRONIC TOXICITY	A	WAKE FOREST UNIVERSITY/R23 NS 18705-02
STRYCHNINE	57-24-9	PHARMACOKINETICS/METABOLISM	A	UNIV. OF WASHINGTON, SEATTLE R01 NS 08174-16
STRYCHNINE	57-24-9	PHARMACOKINETICS/METABOLISM	A	SOUTHERN ILLINOIS UNIV. SCHOOL OF MEDICINE SPRINGFIELD, ILLINOIS

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NATIONAL INSTITUTE OF NEUROLOGICAL AND COMMUNICATIVE DISORDERS AND STROKE
EXTRAMURAL PROGRAM

243<

CHEMICAL	CAS NO.	TEST TYPE	STATUS	PERFORMING ORGANIZATION/PROJECT NO.
STRYCHNINE	57-24-9			RO1 NS 13849-03S1
WITH PENICILLIN	1406-05-9			
WITH PHENOBARBITAL	50-06-6			
WITH PICROTOXIN	124-87-8			
WITH DIPHENYLHYDANTOIN	57-41-0	PHARMACOKINETICS/METABOLISM	B	STANFORD UNIV., STANFORD, CALIF. P50 NS 12151-09
SULFAPYRAZINE	116-44-9	BIOCHEMICAL/CELLULAR/TISSUE EFFECTS		
SYNTHETIC PYRETHROIDS		SYSTEMIC/ORGAN TOXICITY	B	DUKE VETERANS ADMIN. CTR./P50 NS 06233-19
		CHRONIC TOXICITY	B	NORTHWESTERN UNIV., CHICAGO RO1 NS 14143-08
TETANUS TOXIN		CHRONIC TOXICITY	B	UNIV. OF CALIFORNIA, LOS ANGELES RO1 NS 12873-07A2
TETRODOTOXIN	4368-28-9	PHARMACOKINETICS/METABOLISM	B	HARVARD UNIV., BOSTON/RO1 NS 12108-09
TETRODOTOXIN	4368-28-9	CHRONIC TOXICITY	B	NORTHWESTERN UNIV., CHICAGO RO1 NS 14144-08
TETRODOTOXIN	4368-28-9	BIOCHEMICAL/CELLULAR/TISSUE EFFECTS	B	MEDICAL COLLEGE OF WISCONSIN RO1 NS 18122-03
TETRODOTOXIN ANALOGS		CHRONIC TOXICITY	B	DOWNSTATE MEDICAL CENTER, NEW YORK RO1 NS 14551-05
TRICHLOROBENZOIC ACIDS	1319-85-3	NEUROLOGIC/BEHAVIORAL TOXICITY	B	UNIV. OF PENNSYLVANIA/P50 NS 08075-14
TRIMETHYLOXONIUM	43625-65-6	PHARMACOKINETICS/METABOLISM	A	UNIV. OF WASHINGTON, SEATTLE RO1 NS 08174-16
TRITIUM WITH NEUROTOXINS	10028-17-8	BIOCHEMICAL/CELLULAR/TISSUE EFFECTS	A	UNIV. OF VIRGINIA, DEPT. OF PATHOLOGY/ RO1 NS 19351-02
VERATRIDINE	71-62-5	CHRONIC TOXICITY	B	NORTHWESTERN UNIV., CHICAGO RO1 NS 14144-08
VINBLASTINE WITH NEUROPHARMACOLOGICAL AGENTS	865-21-4	BIOCHEMICAL/CELLULAR/TISSUE EFFECTS	A	MAYO FOUNDATION/RO1 NS 11855-12S1

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TOXICOLOGY TESTING

NATIONAL EYE INSTITUTE
EXTRAMURAL PROGRAM

CHEMICAL	CAS NO.	TEST TYPE	STATUS	PERFORMING ORGANIZATION/PROJECT NO.
ACETAMINOPHEN	103-90-2	CHRONIC TOXICITY BIOCHEMICAL EFFECTS	B	INST. BIOL. SCIENCES, ROCHESTER, MI/ 5R01 EY04694-02
ACYCLOVIR (ACV)	59277-89-3	GENETIC TOXICITY BIOCHEMICAL/CELLULAR/TISSUE EFFECTS SYSTEMIC/ORGAN TOXICITY	A	LOUISIANA STATE UNIV. MEDICAL CENTER/ 5R01 EY02672-07
ACYCLOVIR (ACV)	59277-89-3	BIOCHEMICAL/CELLULAR/TISSUE EFFECTS SYSTEMIC/ORGAN TOXICITY	A	MASSACHUSETTS EYE AND EAR INFIRMARY/ 5R01 EY02268-07
ADRIAMYCIN	23214-92-8	ACUTE/CHRONIC TOXICITY	B	UNIV. OF MIAMI, SCHOOL OF MEDICINE 5R23 EY03934-03
ADRIAMYCIN	23214-92-8	CHRONIC TOXICITY CELLULAR EFFECTS	B	BAYLOR COLL. OF MEDICINE/5R01 EY04554-02
AMIKACIN		BIOCHEMICAL/CELLULAR/TISSUE EFFECTS	B	MASSACHUSETTS EYE AND EAR INFIRMARY/ 1F32 EY05769-01
5'-AMINO-5'-DEOXYTHYMIDINE (ATdR)		CHRONIC TOXICITY CLINICAL TOXICOLOGY	B	MASSACHUSETTS EYE AND EAR INFIRMARY/ 2R01 EY02268-07
5'-AMINO-5-IODO-2'-DEOXYURIDINE		BIOCHEMICAL/CELLULAR/TISSUE EFFECTS SYSTEMIC/ORGAN TOXICITY	B	MASSACHUSETTS EYE AND EAR INFIRMARY/ 5R01 EY02268-07
BENZOCTAMINE HCl		BIOCHEMICAL/CELLULAR/TISSUE EFFECT SYSTEMIC/ORGAN TOXICITY	A	LOUISIANA STATE UNIV. MEDICAL CENTER/ 5R01 EY02672-07
BETA-AMINO-PROPRIONITRILE		BIOCHEMICAL/CELLULAR/TISSUE EFFECTS	B	UNIV. OF TEXAS HEALTH SCIENCES CENTER/ 1R01 EY-05261-01
BRADYKININ		PHARMACOKINETICS/METABOLISM	B	UNIV. OF WISCONSIN MEDICAL SCHOOL/ 5R01 EY02698-06
BROMDEOXYURIDINE	59-14-3	BIOCHEMICAL/CELLULAR/TISSUE EFFECTS	A	LOUISIANA STATE UNIV. MEDICAL CENTER/ 5R01 EY02672-07
5-(2-BROMOVINYL)-2'-DEOXYURIDINE	69304-47-8	BIOCHEMICAL/CELLULAR/TISSUE EFFECTS SYSTEMIC/ORGAN TOXICITY	B	MASSACHUSETTS EYE AND EAR INFIRMARY/ 5R01 EY02268-07
T-BUTYLATED HYDROXY-ANISOL (BHA)		BIOCHEMICAL/CELLULAR/TISSUE EFFECTS	B	UNIV. OF TEXAS MEDICAL BR. GALVESTON/ 5R01 EY04396-02
T-BUTYLATED HYDROXY-TOLUENE (BHT)	128-37-0	BIOCHEMICAL/CELLULAR/TISSUE EFFECTS	B	UNIV. OF TEXAS MEDICAL BR. GALVESTON/ 5R01 EY04396-02

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CADMIUM SULFIDE		BIOCHEMICAL/CELLULAR/TISSUE EFFECTS SYSTEMIC/ORGAN TOXICITY	B	MEDICAL COLLEGE OF GEORGIA/ 2R01 EY04479-03
CALCIUM IONOPHORE		PHARMACOKINETICS/METABOLISM	B	UNIV. OF WISCONSIN MEDICAL SCHOOL/ 5R01 EY02698-06
CALMODULIN		PHARMACOKINETICS/METABOLISM	B	UNIV. OF WISCONSIN MEDICAL SCHOOL/ 5R01 EY02698-06
CANNABINOIDS		PHARMACOKINETICS/METABOLISM	B	UNIV. OF WISCONSIN MEDICAL SCHOOL/ 5R01 EY02698-06
CANNABINOIDS		CHRONIC TOXICITY	B	WEST VIRGINIA MEDICAL SCHOOL/5R01 EY03520-03
CEFAZOLIN		BIOCHEMICAL/CELLULAR/TISSUE EFFECTS	B	MASSACHUSETTS EYE AND EAR INFIRMARY/ 1F32 EY05769-01
CYTOCHALASIN B		PHARMACOKINETICS/METABOLISM	B	UNIV. OF WISCONSIN MEDICAL SCHOOL/ 5R01 EY02698-06
CYTOCHALASIN D	14930-96-2	PHARMACOKINETICS/METABOLISM	B	UNIV. OF WISCONSIN MEDICAL SCHOOL/ 5R01 EY02698-06
DAUNORUBICIN	20830-81-3	BIOCHEMICAL/CELLULAR/TISSUE EFFECTS	B	UNIV. OF TEXAS HEALTH SCIENCES CENTER/ 1R01 EY05261-01
DEXAMETHASONE	50-02-2	CHRONIC TOXICITY CELLULAR EFFECTS	B	UNIV. OF CALIFORNIA SCHOOL OF MEDICINE, SAN FRANCISCO/ 5R01 EY03228-05
3',5'DI-O-ACETYL-5-IODO-2'-DEOXYCYTIDINE		BIOCHEMICAL/CELLULAR/TISSUE EFFECTS SYSTEMIC/ORGAN TOXICITY	B	MASSACHUSETTS EYE AND EAR INFIRMARY/ 5R01 EY02268-07
ECHOTHIOPATE		PHARMACOKINETICS/METABOLISM	B	UNIV. OF WISCONSIN MEDICAL SCHOOL/ 5R01 EY02698-06
5-FLUORO-2'-DEOXYURIDINE (FUdR)		CHRONIC TOXICITY CELLULAR EFFECTS	B	UNIV. OF CALIFORNIA SCHOOL OF MEDICINE, SAN FRANCISCO/ 5R01 EY03228-05
5-FLUOROURACIL (5-FU)	51-21-8	CHRONIC TOXICITY	B	UNIV. OF MIAMI, SCHOOL OF MEDICINE/ 5R23 EY03934-03
5-FLUOROURACIL	51-21-8	BIOCHEMICAL/CELLULAR/TISSUE EFFECTS SYSTEMIC/ORGAN TOXICITY	B	UNIV. OF CALIFORNIA SCHOOL OF MEDICINE SAN FRANCISCO/ 5R01 EY03228-05
5-FLUOROURACIL	51-21-8	BIOCHEMICAL/CELLULAR/TISSUE EFFECTS	B	UNIV. OF TEXAS HEALTH SCIENCE CENTER, HOUSTON/ 1R01 EY-5261-01
GENTAMICIN	1403-66-3	CHRONIC TOXICITY	B	MASSACHUSETTS EYE AND EAR INFIRMARY/ 5R23 EY04474-03
GENTAMICIN	1403-66-3	BIOCHEMICAL/CELLULAR/TISSUE EFFECTS	B	MASSACHUSETTS EYE AND EAR INFIRMARY/ 1R01 EY05261-01
HEMATOPORPHYRIN		BIOCHEMICAL/CELLULAR/TISSUE EFFECTS SYSTEMIC/ORGAN TOXICITY	B	MEDICAL COLLEGE OF GEORGIA/ 2R01 EY04479-03

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TOXICOLOGY TESTING

NATIONAL EYE INSTITUTE
EXTRAMURAL PROGRAM

CHEMICAL	CAS NO.	TEST TYPE	STATUS	PERFORMING ORGANIZATION/PROJECT NO.
HISTAMINE	51-45-6	PHARMACOKINETICS/METABOLISM	B	UNIV. OF WISCONSIN MEDICAL SCHOOL/ 5R01 EY02698-06
HYDROGEN PEROXIDE	7722-84-1	BIOCHEMICAL/CELLULAR/TISSUE EFFECTS SYSTEMIC/ORGAN TOXICITY	B	MEDICAL COLLEGE OF GEORGIA/ 2R01 EY04479-03
HYDROGEN PEROXIDE	7722-84-1	BIOCHEMICAL/CELLULAR/TISSUE EFFECTS	B	OAKLAND UNIV. COLLEGE OF ARTS AND SCIENCE/ 5R01 EY04694-02
HYDROGEN PEROXIDE	7722-84-1	BIOCHEMICAL/CELLULAR/TISSUE EFFECTS	B	MASSACHUSETTS EYE AND EAR INFIRMARY/ 5R01 EY05681-02
HYDROXYL RADICAL		BIOCHEMICAL/CELLULAR/TISSUE EFFECTS	B	MASSACHUSETTS EYE AND EAR INFIRMARY/ 5R01 EY05681-02
HYDROXYL RADICAL		BIOCHEMICAL/CELLULAR/TISSUE EFFECTS	B	MEDICAL COLLEGE OF GEORGIA/2R01 EY04479-03
CIS-HYDROXYPROLINE		BIOCHEMICAL/CELLULAR/TISSUE EFFECTS	B	UNIV. OF TEXAS HEALTH SCIENCE CENTER, HOUSTON/1R01 EY05261-01
INDOMETHECIN	53-86-1	PHARMACOKINETICS/METABOLISM	A	UNIV. OF MIAMI SCHOOL OF MEDICINE/ 5R23 EY03934-03
5'-IODO-2'-DEOXYURIDINE (IDOXURIDINE)	54-42-2	CHRONIC TOXICITY CLINICAL TOXICOLOGY	B	MASSACHUSETTS EYE AND EAR INFIRMARY/ 5R01 EY02268-07
INTERFERON	9008-11-1	CLINICAL TOXICOLOGY/EPIDEMIOLOGY	B	LOUISIANA STATE UNIV. MED. CTR. 5R01 EY02672-07
5-IODO-5'-AMINO-2',5'-DIDEOXYCYTIDINE (AIC)		CHRONIC TOXICITY	B	MASSACHUSETTS EYE AND EAR INFIRMARY/ 5R01 EY02268-07
5-IODO-5'-AMINO-2',5'-DIDEOXYURIDINE (AIU)		CHRONIC TOXICITY CLINICAL TOXICOLOGY	B	MASSACHUSETTS EYE AND EAR INFIRMARY/ 5R01 EY02268-07
KANAMYCIN	59-01-8	SYSTEMIC/ORGAN TOXICITY BIOCHEMICAL/CELLULAR/TISSUE EFFECTS	A	MASSACHUSETTS EYE AND EAR INFIRMARY/ 5F23 EY-04474-03
KAINATE		BIOCHEMICAL/CELLULAR/TISSUE EFFECTS	A	EYE RESEARCH INSTITUTE OF RETINA FDN./ 5F32 EY05706-02
MECLOFENAMIC ACID		PHARMACOKINETICS/METABOLISM	A	UNIVERSITY OF MIAMI SCHOOL OF MEDICINE/ 5R23 EY03934-03
METHOTREXATE	59-05-2	CHRONIC TOXICITY	B	UNIV. OF MIAMI, SCHOOL OF MEDICINE/ 5R23 EY03934-03
METHOTREXATE	59-05-2	CHRONIC TOXICITY CELLULAR EFFECTS	B	UNIV. OF CALIFORNIA SCHOOL OF MEDICINE, SAN FRANCISCO/ 5R01 EY03228-05
METHOTREXATE GAMMA ASPARTATE		CHRONIC TOXICITY CELLULAR EFFECTS	B	UNIV. OF CALIFORNIA SCHOOL OF MEDICINE, SAN FRANCISCO/5R01 EY03228-05
PENICILLAMINE	52-67-5	BIOCHEMICAL/CELLULAR/TISSUE EFFECTS	B	UNIV. OF CALIFORNIA SCHOOL OF MEDICINE,

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TOXICOLOGY TESTING

NATIONAL EYE INSTITUTE
EXTRAMURAL PROGRAM

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		SYSTEMIC/ORGAN TOXICITY		SAN FRANCISCO/5R01 EY03228-05
D-PENICILLAMINE	52-67-5	BIOCHEMICAL/CELLULAR/TISSUE EFFECTS	B	UNIV. OF TEXAS HEALTH SCIENCE CENTER, HOUSTON/1R01 EY05261-01
PILOCARPINE	92-13-7	PHARMACOKINETICS/METABOLISM	B	UNIV. OF WISCONSIN MEDICAL SCHOOL/ 5R01 EY02698-06
SEROTONIN	50-67-9	PHARMACOKINETICS/METABOLISM	B	UNIV. OF WISCONSIN MEDICAL SCHOOL/ 5R01 EY02698-06
STREPTOMYCIN	57-92-1	BIOCHEMICAL/CELLULAR/TISSUE EFFECTS SYSTEMIC/ORGAN TOXICITY	A	MASSACHUSETTS EYE AND EAR INFIRMARY/ 5R23 EY04474-03
SUPEROXIDE ANION		BIOCHEMICAL/CELLULAR/TISSUE EFFECTS SYSTEMIC/ORGAN TOXICITY	B	MEDICAL COLLEGE OF GEORGIA/ 2R01 EY04479-03
SUPEROXIDE ANION		BIOCHEMICAL/CELLULAR/TISSUE EFFECTS	B	MASSACHUSETTS EYE AND EAR INFIRMARY/ 5R01 EY05681-02
SUPEROXIDE RADICAL		BIOCHEMICAL/CELLULAR/TISSUE EFFECTS	B	CHILDREN'S HOSPTIAL, BOSTON/ 5R01 EY05318-02
TOBRAMYCIN	32986-56-4	CHRONIC TOXICITY BIOCHEMICAL/CELLULAR/TISSUE EFFECTS	B	MASSACHUSETTS EYE AND EAR INFIRMARY/ 5R23 EY04474-03
TOBRAMYCIN	32986-56-4	BIOCHEMICAL/CELLULAR/TISSUE EFFECTS	B	MASSACHUSETTS EYE AND EAR INFIRMARY/ 1F32 EY05769-01
TRIAMCINOLONE		BIOCHEMICAL/CELLULAR/TISSUE EFFECTS SYSTEMIC/ORGANIC TOXICITY	B	UNIV. OF CALIFORNIA SCHOOL OF MEDICINE, SAN FRANCISCO 5R01 EY03228-05
TRIAMCINOLONE		PHARMACOKINETICS/METABOLISM	A	UNIV. OF MIAMI SCHOOL OF MEDICINE/ 5R23 EY03934-03
5'-TRIFLUOROMETHYL-5'-AMINO-2',5'-DIDEOXYURIDINE (AF3U)		CHRONIC TOXICITY CLINICAL TOXICOLOGY	B	MASSACHUSETTS EYE AND EAR INFIRMARY/ 5R01 EY02268-07
TRIFLUOROTHYMIDINE	70-00-8	BIOCHEMICAL/CELLULAR/TISSUE EFFECTS SYSTEMIC/ORGAN TOXICITY	B	LOUISIANA STATE UNIV. MEDICAL CENTER/ 5R01 EY02672-06
VANADATE		CHRONIC TOXICITY	B	MOUNT SINAI SCHOOL OF MEDICINE/ 5R01 EY03651-04
VIDARABINE (ARA-A)		BIOCHEMICAL/CELLULAR/TISSUE EFFECTS SYSTEMIC/ORGAN TOXICITY	B	MASSACHUSETTS EYE AND EAR INFIRMARY/ 5R01 EY02268-07

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TOXICOLOGY TESTING

NATIONAL INSTITUTE OF DENTAL RESEARCH

CHEMICAL	CAS NO.	TEST TYPE	STATUS	PERFORMING ORGANIZATION/PROJECT NO.
6-AMINONICOTINAMIDE	329-89-5	REPRODUCTIVE/DEVELOPMENTAL TOXICITY	B	UNIVERSITY OF MICHIGAN/R01 DE 6108
BETA-CAROTENE	7235-40-7	BIOCHEMICAL/CELLULAR/TISSUE EFFECTS	B	LOUISIANA STATE UNIV. MEDICAL CENTER R01 DE 6893
CATECHOLAMINES	9012-25-3	REPRODUCTIVE/DEVELOPMENTAL TOXICITY	B	THOMAS JEFFERSON UNIV., PHILADELPHIA, PA R01 DE 6553
CORTISONE	53-06-5	REPRODUCTIVE/DEVELOPMENTAL TOXICITY	B	CHILDREN'S HOSP. OF PHILADELPHIA R01 DE 4622
CORTISONE	53-06-5	REPRODUCTIVE/DEVELOPMENTAL TOXICITY	B	UNIV. OF PENNSYLVANIA/R01 DE 5008
CORTISONE ACETATE		REPRODUCTIVE/DEVELOPMENTAL TOXICITY	B	UNIV. OF NORTH CAROLINA/R03 DE 6273
CYTOXAN	50-18-0	SYSTEMIC/ORGAN TOXICITY	B	UNIV. OF WASHINGTON/P50 DE 2600-0034
DICALCIUM PHOSPHATE DIHYDRATE	7757-93-9	BIOCHEMICAL/CELLULAR/TISSUE EFFECTS	A	NIDR/Z01 DE 112-SHERN
DIMETHYLBENZANTHRACENE	57-97-6	CARCINOGENESIS	B	OHIO STATE UNIVERSITY/R01 DE 6893
DIPHENYLHYDANTOIN	57-41-0	REPRODUCTIVE/DEVELOPMENTAL TOXICITY	B	CHILDREN'S HOSP. OF PHILADELPHIA R01 DE 5041
DIPHENYLHYDANTOIN	57-41-0	REPRODUCTIVE/DEVELOPMENTAL TOXICITY	B	UNIV. OF NORTH CAROLINA/R03 DE 6273
DIPHENYLHYDANTOIN	57-41-0	REPRODUCTIVE/DEVELOPMENTAL TOXICITY	B	UNIV. OF SOUTHERN CALIFORNIA/R01 DE 5440
ETHANOL	64-17-5	NEUROLOGIC/BEHAVIORAL TOXICITY	B	AMERICAN DENTAL ASSOCIATION/R03 DE 6823
FLUORIDE	16984-48-8	PHARMACOKINETICS/METABOLISM	B	UNIV. OF MINNESOTA/P01 DE 1850
FORMALDEHYDE	50-00-0	BIOCHEMICAL/CELLULAR/TISSUE EFFECTS	B	UNIVERSITY OF TEXAS/R03 DE 6446
GLUCOCORTICOIDS		REPRODUCTIVE/DEVELOPMENTAL TOXICITY	B	THOMAS JEFFERSON UNIV., PHILADELPHIA, PA R01 DE 6553
HYDROGEN PEROXIDE	7722-84-1	CLINICAL TOXICOLOGY/EPIDEMIOLOGY	B	STATE UNIVERSITY OF NEW YORK/R23 DE 6757
MERCURY	7439-97-6	CLINICAL TOXICOLOGY/EPIDEMIOLOGY	B	AMERICAN DENTAL ASSOCIATION/R03 DE 6600
MERCURY	7439-97-6	NEUROLOGIC/BEHAVIORAL TOXICITY	B	AMERICAN DENTAL ASSOCIATION/R03 DE 6823
METHOTREXATE	59-05-2	SYSTEMIC/ORGAN TOXICITY	B	UNIV. OF WASHINGTON/P50 DE 2600-0034
NITROUS OXIDE	10024-97-2	NEUROLOGIC/BEHAVIORAL TOXICITY	B	FORSYTH DENTAL CENTER/R01 DE 7011
OCTENIDINE	71251-02-0	ACUTE/CHRONIC TOXICITY	D	NIDR/Z01 DE 113-SHERN
PHENYTOIN	57-41-0	REPRODUCTIVE/DEVELOPMENTAL TOXICITY	B	UNIV. OF NORTH CAROLINA/P50 DE 2668-0172
PHENYTOIN	57-41-0	REPRODUCTIVE/DEVELOPMENTAL TOXICITY	B	UNIVERSITY OF MICHIGAN/R01 DE 6108
PHENYTOIN	57-41-0	REPRODUCTIVE/DEVELOPMENTAL TOXICITY	B	UNIV. OF NORTH CAROLINA/R01 DE 6216
POLYAMINES		REPRODUCTIVE/DEVELOPMENTAL TOXICITY	B	FAIRLEIGH DICKENSON UNIV./R23 DE 6040
SODIUM FLUORIDE	7681-49-4	PHARMACOKINETICS/METABOLISM	A	NIDR/Z01 DE 262-SHERN
STEVIOL	471-80-7	MUTAGENESIS/GENETIC TOXICITY	B	UNIVERSITY OF ILLINOIS/R03 DE 6678
TRIAMCINOLONE HEXACETONIDE	5611-51-8	REPRODUCTIVE/DEVELOPMENTAL TOXICITY	B	UNIV. OF SOUTHERN CALIFORNIA/P01 DE 2848
VARIANT III SCORPION TOXIN		BIOCHEMICAL/CELLULAR/TISSUE EFFECTS	B	UNIV. OF ALABAMA/P50 DE 2670-0001
VITAMIN A	68-26-8	BIOCHEMICAL/CELLULAR/TISSUE EFFECTS	B	LOUISIANA STATE UNIVERSITY R01 DE 6893
VITAMIN D	1406-16-2	PHARMACOKINETICS/METABOLISM	B	UNIVERSITY OF NORTH CAROLINA/R01 DE 6854

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TOXICOLOGY TESTING

DIVISION OF RESEARCH SERVICES, NIH

CHEMICAL	CAS NO.	TEST TYPE	STATUS	PERFORMING ORGANIZATION/PROJECT NO.
1,3-BIS(2-CHLOROETHYL)-1-NITROSOUREA	154-93-8	PHARMACOKINETICS/METABOLISM	B	BIOMED. ENG. AND INSTRUM. BRANCH Z01-RS 10001-17
CHLORINATED BIPHENYLS		PHARMACOKINETICS/METABOLISM	A	BIOMED. ENG. AND INSTRUM. BRANCH Z01-RS 10001-17
CIS-DICHLORODIAMINE PLATINUM	15663-27-1	PHARMACOKINETICS/METABOLISM	B	BIOMED. ENG. AND INSTRUM. BRANCH Z01-RS 10001-17

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TOXICOLOGY TESTING

NATIONAL INSTITUTE OF MENTAL HEALTH

CHEMICAL	CAS NO.	TEST TYPE	STATUS	PERFORMING ORGANIZATION/PROJECT NO.
BENZODIAZEPINES		NEUROLOGIC/BEHAVIORAL TOXICITY	B	UNIV. OF ROCHESTER/5R01 MH31850-05
LITHIUM	7439-93-2	CHRONIC TOXICITY	B	WASHINGTON UNIVERSITY/5R01 MH37967
LITHIUM	7439-93-2	CHRONIC TOXICITY	B	UNIV PENNA./5 R01 MH33242-05
NEUROLEPTICS		CHRONIC/SUBACUTE TOXICITY	B	L.I. JEWISH-HILLSIDE HOSP. 2 R01 MH32369-06
NEUROLEPTICS		CHRONIC TOXICITY	B	UNIV. ILLINOIS/2 R01 MH32206-06
NEUROLEPTICS		SUBCHRONIC TOXICITY	B	TEXAS RES. INST. OF MENTAL SCIENCES/ 5R01 MH 34692-03
NEUROLEPTICS		CHRONIC TOXICITY	B	UNIV. MICHIGAN/5R01 MH 36044-13
NEUROLEPTICS		CHRONIC TOXICITY	B	MEDICAL RESEARCH FOUNDATION OF OREGON 5R01 MH 36657-03
NEUROLEPTICS		SUBCHRONIC TOXICITY	B	YALE UNIVERSITY/5 R01 MH28849-08
NEUROLEPTICS		CHRONIC TOXICITY	B	UNIVERSITY OF ROCHESTER/5R01 MH11757-19
NEUROLEPTICS		CHRONIC TOXICITY	A	BOSTON MENTAL HEALTH FOUNDATION/ 2R01 MH32675-05
PSYCHOTROPICS		SUBACUTE TOXICITY	B	TENNESSEE NEUROPSYCHIATRIC INSTITUTE/ 5R01 MH38768-08
PSYCHOTROPICS		SUBACUTE TOXICITY	B	RESEARCH FOUNDATION FOR MENTAL HYGIENE/ 5R01 MH38753-02

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TOXICOLOGY TESTING

NATIONAL INSTITUTE ON DRUG ABUSE

CHEMICAL	CAS NO.	TEST TYPE	STATUS	PERFORMING ORGANIZATION/PROJECT NO.
DELTA-9-TETRAHYDROCANNABINOL	1972-08-3	NEUROLOGIC/BEHAVIORAL TOXICITY	B	NATL. CENTER FOR TOXICOLOGICAL RESEARCH

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DEPARTMENT OF ENERGY
OFFICE OF HEALTH AND ENVIRONMENTAL RESEARCH

CHEMICAL	CAS NO.	TEST TYPE	STATUS	PERFORMING ORGANIZATION/PROJECT NO.
ALKYLATING AGENTS		MUTAGENESIS/GENETIC TOXICITY	B	OAK RIDGE NAT'L. LAB./1570
ALKYLATING AGENTS WITH INSECTICIDES		BIOCHEMICAL/CELLULAR/TISSUE EFFECTS CARCINOGENESIS	B	UNIVERSITY OF CHICAGO/8328
BOILING POINT FRACTIONS OF COAL LIQUEFACTION PRODUCTS		BIOCHEMICAL/CELLULAR/TISSUE EFFECTS CARCINOGENESIS/MUTAGENESIS IN VITRO	A	PACIFIC NORTHWEST LABORATORY; OAK RIDGE NATL. LAB./25-30-10
CADMIUM	7440-43-9		B	LOS ALAMOS NATIONAL LABORATORY/2438
CADMIUM WITH CALCIUM	7440-43-9 7440-70-2	SYSTEMIC/ORGAN TOXICITY	B	OAK RIDGE RESEARCH INSTITUTE/9024
COAL COMBUSTION PRODUCTS		ACUTE/CHRONIC TOXICITY CARCINOGENESIS MUTAGENESIS/GENETIC TOXICITY PULMONARY TOXICITY	B	UNIV. CALIFORNIA, DAVIS/4834
COAL DUST/FLY ASH PARTICULATES		PULMONARY TOXICITY	B	BROOKHAVEN NATIONAL LABORATORY/0046
COAL GASIFICATION MATERIALS		BIOCHEMICAL/CELLULAR/TISSUE EFFECTS CARCINOGENESIS MUTAGENESIS/GENETIC TOXICITY	B	ARGONNE NAT'L. LAB./3439
COAL LIQUEFACTION MATERIALS		ACUTE/CHRONIC TOXICITY CARCINOGENESIS IMMUNOLOGIC TOXICITY MUTAGENESIS/GENETIC TOXICITY NEUROLOGIC/BEHAVIORAL TOXICITY PHARMACOKINETICS/METABOLISM PULMONARY TOXICITY SYSTEMIC/ORGAN TOXICITY REPRODUCTIVE/DEVELOPMENTAL TOXICITY	B	BATTELLE PACIFIC NORTHWEST LAB./2710
COAL LIQUEFACTION MATERIALS		MUTAGENESIS/GENETIC TOXICITY	B	OAK RIDGE NAT'L. LAB./1569
COAL LIQUEFACTION MATERIALS		MUTAGENESIS/GENETIC TOXICITY PHARMACOKINETICS/METABOLISM	B	BATTELLE PACIFIC NORTHWEST LAB./1994
COAL LIQUEFACTION MATERIALS		ACUTE/CHRONIC TOXICITY IMMUNOLOGIC TOXICITY NEUROLOGIC/BEHAVIORAL TOXICITY PULMONARY TOXICITY SYSTEMIC/ORGAN TOXICITY REPRODUCTIVE/DEVELOPMENTAL TOXICITY	B	OAK RIDGE NAT'L. LAB./2362

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TOXICOLOGY TESTING

DEPARTMENT OF ENERGY
OFFICE OF HEALTH AND ENVIRONMENTAL RESEARCH

CHEMICAL	CAS NO.	TEST TYPE	STATUS	PERFORMING ORGANIZATION/PROJECT NO.
COAL LIQUEFACTION MATERIALS		ACUTE/CHRONIC TOXICITY		
		REPRODUCTIVE/DEVELOPMENTAL TOXICITY	B	BATTELLE PACIFIC NORTHWEST LAB./3453
COMBUSTION FLY ASH		BIOCHEMICAL/CELLULAR/TISSUE EFFECTS		
		PULMONARY TOXICITY	B	INHALATION TOXICOL. RES. INST./4496
ETHYLNITROSOUREA	759-73-9	MUTAGENESIS/GENETIC TOXICITY	B	JACKSON LABORATORIES/RPIS 8948
FLY ASH ASSOCIATED HYDROCARBONS		MUTAGENESIS/GENETIC TOXICITY		UNIV. CALIFORNIA, RIVERSIDE/8095
HEAVY METALS ON PARTICLES		BIOCHEMICAL/CELLULAR/TISSUE EFFECTS		
		PULMONARY TOXICITY	B	LAWRENCE BERKELEY LABORATORY/4030
HYDROTREATED COAL LIQUEFACTION PRODUCTS				
		BIOCHEMICAL/CELLULAR/TISSUE EFFECTS	B	OAK RIDGE NATIONAL LABORATORY/00216
NICKEL COMPOUNDS		ACUTE/CHRONIC TOXICITY	B	UNIV. OF CONNECTICUT/8954
OIL SHALE		CARCINOGENESIS		
		MUTAGENESIS/GENETIC TOXICITY	B	LOS ALAMOS SCI. LAB./1877
OIL SHALE PRODUCTS		CLINICAL TOXICOLOGY/EPIDEMIOLOGY	B	LOS ALAMOS NATIONAL LABORATORY/3005
PARTICLES FROM OIL SHALE RETORTING				
		ACUTE/CHRONIC TOXICITY		
		CARCINOGENESIS		
		PHARMACOKINETICS/METABOLISM		
		PULMONARY TOXICITY	B	LOS ALAMOS SCI. LAB./2525
POLYNUCLEAR AROMATIC HYDROCARBONS				
		MUTAGENESIS/GENETIC TOXICITY		
		LIGHT ACTIVATION	B	LOS ALAMOS SCI. LAB./0134
SHALE OIL PRODUCTS		CLINICAL TOXICOLOGY/EPIDEMIOLOGY	B	GOVERNMENT OF SCOTLAND/8719

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CHEMICAL	CAS NO.	TEST TYPE	STATUS	PERFORMING ORGANIZATION/PROJECT NO.
AMMONIUM NITRATE	6484-52-2	IMMUNOLOGIC TOXICITY		
AMMONIUM NITRITE		PULMONARY TOXICITY	B	HERL/A119B0301
AMMONIUM SULFATE	7783-20-2	IMMUNOLOGIC TOXICITY		
		PULMONARY TOXICITY	B	HERL/A119B0301
ARSENIC	7440-38-2	CARCINOGENESIS	A	HERL/B107B0701
ASBESTOS	1332-21-4	CARCINOGENESIS		
		TISSUE EFFECTS		
		MUTAGENESIS/GENETIC TOXICITY	B	HERL/L104D0501
ASPHALTIC BASED PAINTS		CARCINOGENESIS		
		MUTAGENESIS/GENETIC TOXICITY	B	HERL/C104A0701
CARBON MONOXIDE	630-08-0	NEUROLOGIC/BEHAVIORAL TOXICITY	B	HERL/A114A0101
CARBON MONOXIDE	630-08-0	SYSTEMIC/ORGAN TOXICITY	B	HERL/A114A0101
CARBON TETRACHLORIDE	56-23-0	SUBCHRONIC TOXICITY		
		SYSTEMIC/ORGAN TOXICITY		
		CARCINOGENEIS		
		MUTAGENESIS		
		REPRODUCTIVE TOXICITY	C	HERL/C104C0901
CARBON TETRACHLORIDE	56-23-5	BIOCHEMICAL/CELLULAR/TISSUE EFFECTS		
		CARCINOGENESIS		
		SYSTEMIC/ORGAN TOXICITY	A	HERL/C104A0601; A0602
CHLORAMINE	10599-90-3	PHARMACOKINETICS/METABOLISM		
		REPRODUCTIVE/DEVELOPMENTAL TOXICITY		
		SYSTEMIC/ORGAN TOXICITY	B	HERL/C104A0802
CHLORINATION BI-PRODUCTS		CARCINOGENESIS	B	HERL/C104A2201, A2202
CHLORINE (CHLORINATED DRINKING WATER)	7990-92-3	CARCINOGENESIS		
		MUTAGENESIS/GENETIC TOXICITY		
		REPRODUCTIVE/DEVELOPMENTAL TOXICITY	B	HERL/C104A0801
CHLORINE (CHLORINATED DRINKING WATER)	7990-92-3	PHARMACOKINETICS/METABOLISM		
		REPRODUCTIVE/DEVELOPMENTAL TOXICITY		
		SYSTEMIC/ORGAN TOXICITY	B	HERL/C104A0802
CHLORINE DIOXIDE	10049-04-4	PHARMACOKINETICS/METABOLISM		
		REPRODUCTIVE/DEVELOPMENTAL TOXICITY		
		SYSTEMIC/ORGAN TOXICITY	B	HERL/C104A0802
COAGULANTS, COAGULANT AIDS		CARCINOGENESIS		
		MUTAGENESIS/GENETIC TOXICITY	B	HERL/C104A0701

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254<

255<

TOXICOLOGY TESTING

ENVIRONMENTAL PROTECTION AGENCY
OFFICE OF RESEARCH AND DEVELOPMENT

CHEMICAL	CAS NO.	TEST TYPE	STATUS	PERFORMING ORGANIZATION/PROJECT NO.
COAL TAR		CARCINOGENESIS MUTAGENESIS/GENETIC TOXICITY		
DRINKING WATER CONTAMINANTS		CARCINOGENESIS MUTAGENESIS/GENETIC TOXICITY REPRODUCTIVE/DEVELOPMENTAL TOXICITY	B	HERL/C104A0701
HALOACETONITRILES		CARCINOGENESIS MUTAGENESIS/GENETIC TOXICITY REPRODUCTIVE/DEVELOPMENTAL TOXICITY	B	HERL/C104A0601
HALOGENATED ACETONITRILES		CARCINOGENESIS PHARMACOKINETICS/METABOLISM REPRODUCTIVE/DEVELOPMENTAL TOXICITY	B	HERL/C104A0801
HALOGENATED ETHANES		CARCINOGENESIS REPRODUCTIVE/DEVELOPMENTAL TOXICITY	B	HERL/C104A0801
HAZARDOUS AIR POLLUTANTS		PHARMACOKINETICS/METABOLISM PULMONARY TOXICITY	B	HERL/C104A0602
HUMIC ACID	1415-93-6	CARCINOGENESIS MUTAGENESIS/GENETIC TOXICITY REPRODUCTIVE/DEVELOPMENTAL TOXICITY	A	HERL/A109C0403
INORGANIC DRINKING WATER CONTAMINANTS LEAD		NEUROLOGIC/BEHAVIORAL TOXICITY PHARMACOKINETICS/METABOLISM SYSTEMIC/ORGAN TOXICITY	B	HERL/C104A0801
LEAD	7439-92-1	NEUROLOGIC/BEHAVIORAL TOXICITY SYSTEMIC/ORGAN TOXICITY	B	HERL/C104A0602
METHYLBENZENE	108-88-3	REPRODUCTIVE/DEVELOPMENTAL TOXICITY	A	HERL/A119B0303
NICKEL	7440-02-0	PHARMACOKINETICS/METABOLISM PULMONARY TOXICITY	B	HERL/C104C0901
NITROGEN DIOXIDE	10102-44-0	CHRONIC/SUBCHRONIC TOXICITY IMMUNOLOGIC TOXICITY PULMONARY TOXICITY SYSTEMIC/ORGAN TOXICITY	A	HERL/A109C0403
NITROGEN DIOXIDE	10102-44-0	CHRONIC/SUBCHRONIC TOXICITY BIOCHEMICAL/CELLULAR/TISSUE EFFECTS IMMUNOLOGIC TOXICITY PULMONARY TOXICITY	B	HERL/A104B0201
NITROGEN DIOXIDE	10102-44-0	EPIDEMIOLOGY	B	HERL/A104B0202
ORGANIC CHLORAMINES		CARCINOGENESIS	B	HERL/A104B0501
OZONE	10028-15-6	CHRONIC/SUBCHRONIC TOXICITY IMMUNOLOGIC TOXICITY PULMONARY TOXICITY SYSTEMIC/ORGAN TOXICITY	A	HERL/B107B0701
OZONE	10028-15-6	CHRONIC/SUBCHRONIC/TOXICITY BIOCHEMICAL/CELLULAR/TISSUE EFFECTS IMMUNOLOGIC TOXICITY	B	HERL/A104B0201

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TOXICOLOGY TESTING

ENVIRONMENTAL PROTECTION AGENCY
OFFICE OF RESEARCH AND DEVELOPMENT

CHEMICAL	CAS NO.	TEST TYPE	STATUS	PERFORMING ORGANIZATION/PROJECT NO.
OZONE	10028-15-6	PULMONARY TOXICITY BIOCHEMICAL/CELLULAR/TISSUE EFFECTS IMMUNOLOGIC TOXICITY	B	HERL/A104B0202
OZONE PARTICULATES	10028-15-6	PULMONARY TOXICITY EPIDEMIOLOGY IMMUNOLOGIC TOXICITY	B C	HERL/A119B0302 HERL/A104B0501
PESTICIDES PESTICIDES		PULMONARY TOXICITY REPRODUCTIVE/DEVELOPMENTAL TOXICITY ACUTE/CHRONIC TOXICITY	A B	HERL/A119B0301 HERL/E104C0201
PHOSGENE	75-44-5	NEUROLOGIC TOXICITY PHARMACOKINETICS/METABOLISM	B	HERL/E104C0202
PICLORAM		PULMONARY TOXICITY ACUTE/CHRONIC TOXICITY REPRODUCTIVE/DEVELOPMENTAL TOXICITY	A	HERL/A109C0403
PRIORITY AIR POLLUTANTS PRIORITY AIR POLLUTANTS		SYSTEMIC/ORGAN TOXICITY NEUROLOGIC/BEHAVIORAL TOXICITY CARCINOGENESIS MUTAGENESIS/GENETIC TOXICITY SYSTEMIC/ORGAN TOXICITY	B A	HERL/C104A601, C104A602 HERL/A109C0402
RADON SILVER SULFUR DIOXIDE	10043-92-2 7440-22-4 7446-09-5	PULMONARY TOXICITY EPIDEMIOLOGY CARCINOGENESIS IMMUNOLOGIC TOXICITY	B B A	HERL/A109C0401 HERL/C104A2201, A2202 HERL/B107B0701
SULFUR DIOXIDE	7446-09-5	PULMONARY TOXICITY BIOCHEMICAL/CELLULAR/TISSUE EFFECTS IMMUNOLOGIC TOXICITY	B	HERL/A119B0301
SULFUR DIOXIDE	7466-09-5	PULMONARY TOXICITY EPIDEMIOLOGY CHRONIC	B	HERL/A119B0302
SULFURIC ACID	7664-93-9	SUBCHRONIC TOXICITY BIOCHEMICAL/CELLULAR/TISSUE EFFECTS IMMUNOLOGIC TOXICITY	B	HERL/A119B1701
TETRACHLOROETHYLENE TRICHLOROETHYLENE URANIUM-238	127-18-4 79-01-6	PULMONARY TOXICITY CARCINOGENESIS CARCINOGENESIS PHARMACOKINETICS/METABOLISM	B B B	HERL/A119B0302 HERL/C104A0601 HERL/C104A0601
VOLATILE ORGANIC DRINKING WATER CONTAMINANTS		SYSTEMIC/ORGAN TOXICITY	B	HERL/C104A0602
		NEUROLOGIC/BEHAVIORAL TOXICITY PHARMACOKINETICS/METABOLISM SYSTEMIC/ORGAN TOXICITY	A	HERL/C104A0602

TEST STATUS CODE: A = TEST TO BE COMPLETED IN FY 1985 - B = ON TEST IN FY 1985
C = TEST TO BE STARTED IN FY 1985 - D = SELECTED FOR TEST, DATE NOT DETERMINED

Chemical Index by Name

CHEMICAL INDEX

CHEMICAL	CAS NO.	PAGE
ABIETIC ACID	514-10-3	14
ABIETIC ACID	514-10-3	16
ACEBUTOLOL	37517-30-9	65
ACETALDEHYDE	75-07-0	14
ACETALDEHYDE	75-07-0	16
ACETALDEHYDE	75-07-0	36
ACETALDEHYDE	75-07-0	67
ACETALDEHYDE	75-07-0	76
ACETALDOXIME	107-29-9	2
ACETAMINOPHEN	103-90-2	54
ACETAMINOPHEN	103-90-2	75
ACETAMINOPHEN	103-90-2	88
ACETAMINOPHEN	103-90-2	109
ACETIN	26446-35-5	36
ACETOETHYLTETRAMETHYLTETRALIN		51
ACETOETHYLTETRAMETHYLTETRALIN		51
ACETOLAMIDE		54
ACETONE	67-64-1	67
ACETONE	67-64-1	67
ACETONITRILE	75-05-8	42
ACETOPHENETIDIN	62-44-2	85
N-ACETOXY-2-ACETYLAMINOFLUORENE	6098-44-8	54
N-ACETOXY-N-ACETYL-1-AMINOPYRENE		54
N-ACETOXY-AMINOFLUORENE		54
N-ACETOXY-AMINOFLUORENE		54
N-ACETOXY-N-TRIFLUOROACETYL-4-AMINOBIPHENYL		54
2-ACETYLAMINOFLUORENE	53-96-3	54
2-ACETYLAMINOFLUORENE	53-96-3	54
2-ACETYLAMINOFLUORENE	53-96-3	54
2-ACETYLAMINOFLUORENE	53-96-3	54
2-ACETYLAMINOFLUORENE	53-96-3	54
2-ACETYLAMINOFLUORENE	53-96-3	54
(3H)-N-ACETYL-2-AMINOFLUORENE		54
4-ACETYLAMINOFLUORENE	28322-02-3	48
N-ACETYL-2-AMINOFLUORENE	53-96-3	54
2-ACETYLAMINO-4-METHYLPHENOL	6375-17-3	23
N-ACETYL-M-AMINOPHENOL	621-42-1	23
N-ACETYL-1-AMINOPYRENE		54
N-ACETYLBENZIDINE	3366-61-8	54
N-ACETYL-P-BENZOQUINONEIMINE	50700-49-7	54
ACETYLCHOLINE	51-84-3	104
ACETYLCHOLINE	51-84-3	107
ACETYLCHOLINE	51-84-3	97
ACETYLCHOLINE	51-84-3	97
ACETYLCHOLINE	51-84-3	97
ACETYLCHOLINE	51-84-3	105
ACETYLCHOLINE	51-84-3	104
N-ACETYL-N-HYDROXY-2-AMINOFLUORENE	30651-40-2	54

CHEMICAL	CAS NO.	PAGE
N-ACETYL-N-HYDROXY-1-AMINOPYRENE		54
ACETYLSALICYLIC ACID	50-78-2	23
N4-ACETYLSULFAMETHAZINE	100-90-3	54
N4-ACETYLSULFAMETHAZINE	100-90-3	54
N-ACETYL-M-TOLUIDINE	537-92-8	23
N-ACETYL-P-TOLUIDINE	103-89-9	23
ACID ORANGE NO. 3	6373-74-6	42
ACRALDEHYDE DIETHYLACETAL	3054-95-3	2
ACRALDEHYDE OXIME	5314-33-0	2
ACROLEIN	107-02-8	2
ACROLEIN	107-02-8	80
ACROLEIN	107-02-8	80
ACROLEIN DIETHYLACETAL	3054-95-3	17
ACROLEIN OXIME	5314-33-0	17
ACRYLAMIDE	79-06-1	99
ACRYLAMIDE	79-06-1	105
ACRYLAMIDES		97
ACRYLAMIDES		97
ACRYLAMIDES		97
ACRYLONITRILE	107-13-1	20
ACRYLONITRILE	107-13-1	40
ACRYLONITRILE	107-13-1	88
ACRYLONITRILE	107-13-1	88
ACTINOMYCIN D	50-76-0	54
ACYCLOVIR	59277-89-3	93
ACYCLOVIR	59277-89-3	93
ACYCLOVIR	59277-89-3	93
ACYCLOVIR	59277-89-3	93
ACYCLOVIR (ACV)	59277-89-3	109
ACYCLOVIR (ACV)	59277-89-3	109
ADENINE ARABINOSIDE	5536-17-4	93
ADENINE ARABINOSIDE	5536-17-4	93
ADENINE ARABINOSIDE MONOPHOSPHATE	29984-33-6	93
ADENINE NUCLEOTIDES		94
ADENINE NUCLEOTIDES		97
ADENINE NUCLEOTIDES		107
ADENOSINE TRIPHOSPHATE	56-65-5	94
S-ADENOSYL-L-METHIONINE ANALOGS		93
ADIPONITRILE	111-69-3	23
ADRIAMYCIN	23214-92-8	80
ADRIAMYCIN	23214-92-8	186
ADRIAMYCIN	23214-92-8	109
ADRIAMYCIN	23214-92-8	109
AEROALLERGENS		80
AEROSOLS		80
AEROSOLS		80
AFLATOXIN	1402-68-2	51
AFLATOXIN	1402-68-2	51

CHEMICAL INDEX

CHEMICAL	CAS NO.	PAGE
AFLATOXIN	1402-68-2	51
AFLATOXIN (INACTIVATED)	1402-68-2	54
AGARITINE	2757-90-6	23
AIRBORNE PARTICULATES		20
AIR POLLUTANTS		80
AIR POLLUTANTS		97
ALCOHOL	64-17-5	74
ALCOHOL	64-17-5	76
ALCOHOL	64-17-5	76
ALCOHOL	64-17-5	76
ALCOHOL	64-17-5	97
ALCOHOLISM DRINKING		94
ALDICARB	116-06-3	23
ALIPHATIC NITRILES		78
ALKALOIDS		80
ALKYLATING AGENTS		117
ALKYLATING AGENTS		117
ALLANTOIN	97-59-6	9
ALLANTOIN	97-59-6	9
ALLETHRIN	584-79-2	97
ALLOXAN	50-71-5	23
ALLOXAN MONOHYDRATE	3237-50-1	23
ALLOXAN MONOHYDRATE	3237-50-1	36
ALLYL ALCOHOL	107-18-6	2
ALLYL ALCOHOL	107-18-6	17
ALLYLAMINE	107-11-9	78
ALLYL CHLORIDE	107-05-1	54
ALLYL GLYCIDYL ETHER	106-92-3	42
ALLYL ISOTHIOCYANATE	57-06-7	48
ALLYL THIOUREA	109-57-9	23
ALUMINUM	7429-90-5	88
AMIDES		97
AMIDES, ACRYLAMIDES		104
AMIKACIN		109
AMILORIDE HCL	2016-88-8	23
2-AMINOACETANILIDE	555-48-6	23
9-AMINOACRIDINE HYDROCHLORIDE	134-50-9	42
2-AMINOANTHRACENE	613-13-8	36
5-(4-AMINOBENZAMIDO)-2,3-CRESOTIC ACID	6265-15-2	23
2-AMINOBENZENESULFONIC ACID	88-21-1	23
3-AMINOBENZENESULFONIC ACID	121-47-1	23
4-AMINOBENZENESULFONIC ACID	121-57-3	23
2-AMINOBENZIMIDAZOLE	934-32-7	23
6-AMINOBENZO(A)PYRENE	7428-83-3	54
6-AMINOBENZO(A)PYRENE	7428-83-3	54
6-AMINOBENZO(A)PYRENE	7428-83-3	54
6-AMINOBENZO(A)PYRENE	7428-83-3	54
(3H)4-AMINOBIPHENYL		54

CHEMICAL	CAS NO.	PAGE
4-AMINOBIPHENYL	92-67-1	54
GAMMA-AMINOBUTYRIC ACID		97
GAMMA-AMINOBUTYRIC ACID		101
GAMMA-AMINOBUTYRIC ACID		104
2-AMINO-4-CHLORO-6-NITROPHENOL	6358-08-3	23
2-AMINO-6-CHLORO-4-NITROPHENOL	6358-09-4	23
2-AMINO-4-CHLOROPHENOL	95-85-2	23
6-AMINO-4-CHLORO-1-PHENOL-2-SULFONIC ACID	88-23-3	23
5'-AMINO-5'-DEOXYTHYMIDINE (ATdR)		109
1-AMINO-2,4-DIBROMOANTHRAQUINONE	81-49-2	42
2-AMINO-4,6-DICHLOROPHENOL	527-62-8	23
2-AMINO-4,6-DINITROPHENOL	96-91-3	23
2-AMINOFLUORENE	153-78-6	54
2-AMINOFLUORENE	153-78-6	54
AMINOGLYCOSIDE ANTIBIOTICS		88
AMINOGLYCOSIDE ANTIBIOTICS		88
AMINOGLYCOSIDE ANTIBIOTICS		88
AMINOGLYCOSIDE ANTIBIOTICS		97
AMINOGLYCOSIDE ANTIBIOTICS		97
4-AMINO-4q-HYDROXY-3-METHYLDIPHE	6219-89-2	23
5'-AMINO-5-IODO-2'-DEOXYURIDINE		109
1-AMINO-2-METHYLANTHRAQUINONE	82-28-0	23
2-AMINO-4-METHYLPHENOL	95-84-1	23
3-AMINO-4-METHYLPHENOL	2836-00-2	23
3-AMINO-6-METHYLPHENOL	2835-95-2	23
2-AMINO-4-(METHYLSULFONYL)PHENOL	98-30-6	23
6-AMINONICOTINAMIDE	329-89-5	113
2-AMINO-3-NITRO-4-METHYLPHENOL	6265-05-0	23
2-AMINO-5-NITRO-4-METHYLPHENOL	6265-06-1	23
2-AMINO-4-NITROPHENOL	99-57-0	42
2-AMINO-5-NITROPHENOL	121-88-0	42
6-AMINO-4-NITRO-1-PHENOL-2-SULFONIC	96-67-3	24
2-AMINO-6-NITRO-1-PHENOL-4-SULFONIC ACID	96-93-5	23
2-AMINO-1-PHENOL-4-SULFONIC ACID	98-37-3	24
AMINOPHYLLINE	317-34-0	74
N-AMINOPROLINE	10139-05-6	2
BETA-AMINO-PROPRIONITRILE		109
1-AMINOPYRENE	1606-67-3	54
(3H)-1-AMINOPYRENE		55
3-AMINOPYRENOL		55
6-AMINOPYRENOL		55
8-AMINOPYRENOL		55
AMINOPYRIDINES		98
N-AMINOPYRROLIDINE	16596-41-1	2
3-AMINO-5-SULFOSALICYLIC ACID	6201-86-1	24
5-AMINO-3-SULFOSALICYLIC ACID	6201-87-2	24
3-AMINOTRIAZOLE	61-82-5	24
3-AMINOTRIAZOLE	61-82-5	36

CHEMICAL INDEX

CHEMICAL	CAS NO.	PAGE
3-AMINOTRIAZOLE	61-82-5	48
2-AMINO-3,4,6-TRICHLOROPHENOL	6358-15-2	24
11-AMINOUNDECANOIC ACID	2432-99-7	48
AMIODARONE	1951-25-3	65
AMMONIA	7664-41-7	98
AMMONIA	7664-41-7	98
AMMONIUM NITRATE	6484-52-2	119
AMMONIUM NITRITE		119
AMMONIUM SULFATE	7783-20-2	119
AMPHETAMINE	300-62-9	65
D-AMPHETAMINE	51-63-8	55
AMPHETAMINE SULFATE	60-13-9	40
D-AMPHETAMINE SULFATE	51-63-8	55
DL-AMPHETAMINE SULFATE	60-13-9	42
AMPHOTERICIN B	1397-89-3	24
AMPICILLIN TRIHYDRATE	7177-48-2	42
AMPICILLIN TRIHYDRATE	7177-48-2	36
AMYL NITRATE	463-04-7	14
ANALGESICS		88
ANESTHETICS		88
ANESTHETICS		94
ANESTHETICS		103
ANESTHETICS, LOCAL		102
ANESTHETICS, LOCAL		103
ANILAZINE	101-05-3	24
ANTHOPLEURIN-A	60880-63-9	98
ANTHRACENE	120-12-7	51
ANTHRAQUINONE	84-65-1	24
ANTIBIOTICS		75
ANTIBIOTICS		78
ANTIBIOTICS		94
ANTIBIOTICS		95
ANTIBIOTICS		98
ANTIBIOTICS		98
ANTIBIOTICS, ADRIAMYCIN	23214-92-8	104
ANTIBIOTICS, ENDOTOXINS		98
ANTIBIOTICS (PENICILLIN)		99
ANTICONVULSANTS		94
ANTICONVULSANTS		95
ANTICONVULSANTS		95
ANTICONVULSANTS		100
ANTICONVULSANTS		100
ANTICONVULSANTS		101
ANTICONVULSANTS		102
ANTICONVULSANTS		103
ANTICONVULSANTS		103
ANTICONVULSANTS		103
		103

CHEMICAL	CAS NO.	PAGE
ANTICONVULSANTS		103
ANTICONVULSANTS		107
ANTIOXIDANTS		78
ANTHRA[1,9-CD]PYRAZOL-6(2H)-ONE,5-[3-AMINO-PROPYL)AMINO]-7,10-DIHYDROXY-2-[2-[2-HYDROXY-ETHYL)AMINO]-ETHYL]-,HYDRO-CHLORIDE		19
ANTHRA[1,9-CD]PYRAZOL-6(2H)-ONE, 7,10-DIHYDROXY-2[2-[2-HYDRO-XYETHYL)AMINO]-ETHYL]-5-[[2-(METHYL-AMINO)ETHYL]AMINO]		19
APOMORPHINE	58-00-4	98
ARA-A	5536-17-4	93
ARABINOSYLTHYMINE		93
AROCHLOR 1254	11097-69-1	55
AROCLOR 1254	11097-69-1	24
AROMATIC HYDROCARBONS		20
AROMATIC HYDROCARBONS		20
ARSENIC	7440-38-2	74
ARSENIC	7440-38-2	88
ARSENIC	7440-38-2	119
ARSENIC (COMPOUNDS)		101
ARSENIC (COMPOUNDS)		88
ARTIFICIAL FOOD DYES		94
ASBESTOS	1332-21-4	80
ASBESTOS	1332-21-4	119
ASCORBIC ACID	50-81-7	51
ASCORBIC ACID	50-81-7	55
L-ASCORBIC ACID	50-81-7	48
ASPHALTIC BASED PAINTS		119
ASPIRIN	50-78-2	75
ASPIRIN	50-78-2	86
ASPIRIN	50-78-2	88
ATP	56-65-5	98
ATRAZIN	1912-24-9	24
AUTOMOBILE EXHAUST		80
AZA-AROMATIC HYDROCARBONS		20
AZACHOLESTEROL COMPOUNDS		98
5-AZACYTIDINE	320-67-2	14
5-AZACYTIDINE	320-67-2	16
5-AZACYTIDINE	320-67-2	24
5-AZACYTIDINE	320-67-2	36
AZATHIOPRINE	446-86-6	24
AZATHIOPRINE	446-86-6	88
AZATHIOPRINE	446-86-6	100
6-AZAURACIL	461-89-2	94
1-AZIRIDINEETHANOL	1072-52-2	36

261<

CHEMICAL INDEX

CHEMICAL	CAS NO.	PAGE
AZODICARBONAMIDE	123-77-3	22
AZODICARBONAMIDE	123-77-3	36
AZODICARBONAMIDE	123-77-3	42
AZOXYETHANE		17
AZOXYMETHANE	25843-45-2	24
AZOXYMETHANE		17
BACTERIAL ENDOTOXIN		98
BARBITURATES		98
BARBITURATES		103
BARBITURATES (PHENOBARBITAL)		106
BARIUM CHLORIDE DIHYDRATE	10326-27-9	24
BARIUM CHLORIDE DIHYDRATE	10326-27-9	42
BARIUM CHLORIDE DIHYDRATE	10326-27-9	48
BENOMYL	17804-35-2	24
BENZALDEHYDE	100-52-7	42
BENZALDEHYDE	100-52-7	67
BENZAMIDINE DERIVATIVES		70
BENZANTHRACENE	56-55-3	55
BENZANTHRACENE	56-55-3	55
BENZENE SULFONAMIDE, 4-AMINON-(5(or 8)-CHLORO-2 QUINOXALINYL)-		19
BENZENE SULFONIC ACID	98-11-3	24
BENZETHONIUM CHLORIDE	121-54-0	42
BENZETHONIUM CHLORIDE	121-54-0	67
BENZIMIDAZOLE	51-17-2	24
BENZIMIDAZOL-2-YLUREA	24370-25-0	24
BENZINE	71-43-2	22
BENZO(A)ANTHRACENE-TRANS-10,11-DIHYDRODIOL	60967-90-0	55
BENZO(A)ANTHRACENE-TRANS-1,2-DIHYDRODIOL	60967-88-6	55
BENZO(A)ANTHRACENE-TRANS-8,9-DIOL-10,11-EPOXIDE		55
BENZOCTAMINE HC1		109
BENZODIAZEPINES		115
BENZODIAZEPINES		104
BENZOFURAN	271-89-6	42
BENZOIC ACID	65-85-0	24
BENZONITRILE	100-47-0	42
4H-1-BENZOPYRAN-8-ACETIC ACID,4-OXO-2-PHENYL		19
BENZOPYRANS		94
BENZO(A)PYRENE	50-32-8	36
BENZO (A) PYRENE	73467-76-2	40
BENZO(A)PYRENE	50-32-8	55
BENZO(A)PYRENE	50-32-8	88
BENZO(A)PYRENE	50-32-8	40
BENZO(A)PYRENE	50-32-8	36
BENZO(E)PYRENE	192-97-2	24
BENZO(A)PYRENE-CIS-7,8-DIHYDRODIOL	60657-25-2	55
BENZO(A)PYRENE-CIS-7,8-DIHYDRODIOL	60657-25-2	55
BENZO(A)PYRENE-CIS-7,8-DIHYDRODIOL	60657-25-2	55

CHEMICAL	CAS NO.	PAGE
BENZO(A)PYRENE-TRANS-7,8-DIHYDRODIOL	57404-88-3	55
BENZO(A)PYRENE-TRANS-9,10-DIHYDRODIOL	74634-55-2	55
BENZO(A)PYRENE-TRANS-9,10-DIHYDRODIOL	74634-55-2	55
BENZO(A)PYRENE-7,8-DIOL	57303-99-8	55
BENZO(A)PYRENE-TRANS-7,8-DIOL-ANTI-9,10-EPOXIDE		55
BENZO(F)-QUINOLINE	85-02-9	42
BENZO(F)QUINOLINE	85-02-9	21
BENZOTRIAZOLE	27556-51-0	24
BENZOYL CHLORIDE	98-88-4	24
BENZOYL CHLORIDE	98-88-4	42
N-BENZOYLOXY-N-METHYL-4-AMINOBENZENE		55
BENZYL ACETATE	140-11-4	42
BENZYL ACETATE	140-11-4	48
BENZYL ALCOHOL	100-51-6	42
BENZYL ALCOHOL	100-51-6	65
BENZYL ALCOHOL	100-51-6	67
BENZYL CHLORIDE	100-44-7	42
BENZYL CHLORIDE	100-44-7	36
O-BENZYL-P-CHLOROPHENOL	120-32-1	21
O-BENZYL-P-CHLOROPHENOL	120-32-1	42
1-BENZYL-1,3-DIMETHYLTRIAZENE	74649-41-5	12
1-BENZYL-3,3-DIMETHYLTRIAZENE	74649-42-6	12
BERYLLIUM	7440-41-7	80
BERYLLIUM SULFATE TETRAHYDRATE	7787-56-6	24
BICUCULLINE	485-49-4	98
BILIRUBIN	635-65-4	86
2-BIPHENYLAMINE HYDROCHLORIDE	2185-92-4	48
BISACODYL	603-50-9	65
2,2-BIS(BROMOMETHYL)-1,3-PROPANEDIOL	3296-90-0	42
1,3-BIS(TERT-BUTYLDIOXYISOPROPYL)BENZENE	2212-81-9	24
BIS T-BUTYLDIOXYISOPROPYLBENZENE	25155-25-3	24
BIS(2-CHLOROETHYL)ETHER	111-44-4	40
1,3-BIS(2-CHLOROETHYL)-1-NITRO-SOUREA	154-93-8	114
BIS(2-CHLORO-1-METHYLETHYL) ETHER	108-60-1	48
BIS(1,5-CYCLOOCTADIENE) NICKEL	1295-35-8	24
BIS(CYCLOPENTADIENYL)VANADIUM CHLORIDE	12083-48-6	24
BIS(2-ETHYLHEXYL)ISOPHTHALATE	137-89-3	24
N,N-BIS(2-HYDROXYETHYL)-PTOLUIDINE	3077-12-1	14
BIS(2-METHOXYETHYL)ETHER	111-96-6	67
BISPHENOL A	80-05-7	48
BISPHENOL A DIGLYCIDYL ETHER	1675-54-3	36
BIS-(THIOACETOXYL)AURATE(I)		98
(4,4'-BITHIAZOLE)-2,2'-DIAMINE	58139-59-6	24
BITOLTEROL	30392-41-7	65
BIUREA	110-21-4	24
BIUREA	110-21-4	36
BLEOMYCIN	11056-06-7	80
BLEOMYCIN	11056-06-7	80

CHEMICAL INDEX

CHEMICAL	CAS NO.	PAGE
BLEOMYCIN	11056-06-7	80
BLEOMYCIN	11056-06-7	80
BLEOMYCIN		80
BOILING POINT FRACTIONS OF COAL LIQUEFACTION PRODUCT		117
BORIC ACID	10043-35-3	42
BORIC ACID	10043-35-3	48
BOTULINUM TOXIN		98
BOTULINUM TOXIN		98
BRADYKININ		109
BROMDEOXYURIDINE	59-14-3	109
BROMOBENZENE	108-86-1	42
BROMOBENZENE	108-86-1	42
BROMOBENZENE	108-86-1	86
BROMOBENZENE	108-86-1	86
BROMOBENZENE	108-86-1	86
BROMOBENZENE	108-86-1	86
BROMOCHLOROACETALDEHYDE		24
BROMOCHLOROACETONITRILE		24
BROMOCRIPTINE	25614-03-3	98
BROMODICHLOROMETHANE	75-27-4	42
2-BROMO-DMBA		12
3-BROMO-DMBA		12
4-BROMO-DMBA		12
2-ALPHA-BROMOERGOCRIPTINE	25614-03-3	70
BROMOFORM	75-25-2	42
P-BROMOPHENOL	106-41-2	86
BROMOPICRIN	464-10-8	24
1-BROMO-2-PROPANOL	19686-73-8	24
5-(2-BROMOVINYL)-2'-DEOXYURIDINE	69304-47-8	109
BUNAMIDINE	3748-77-4	53
BUNGAROTOXIN	37209-28-2	104
BUNGAROTOXIN	37209-28-2	104
BUNGAROTOXIN	37209-28-2	98
BUNGAROTOXIN	37209-28-2	98
BUNGAROTOXIN	37209-28-2	98
BUNGAROTOXIN	37209-28-2	98
ALPHA BUNGAROTOXIN	11023-79-4	94
BETA-BUNGAROTOXIN	12778-32-4	98
1,3-BUTADIENE	106-99-0	14
1,3-BUTADIENE	106-99-0	22
1,3-BUTADIENE	106-99-0	24
1,3-BUTADIENE	106-99-0	36
1,3-BUTADIENE	106-99-0	40
1,3-BUTADIENE	106-99-0	42
BUTAMISOLE	54400-59-8	53
1,4-BUTANEDIOL DIGLYCIDYL ETHER	2425-79-8	40
2-BUTANONE PEROXIDE	1338-23-4	36
2-BUTANONE PEROXIDE	1338-23-4	42
2-(2-BUTOXYETHOXY)ETHYLTHIOCYANATE	112-56-1	24
N-BUTYL ACETATE	123-86-4	56
N-BUTYL ACRYLATE	141-32-2	56
T-BUTYL ALCOHOL	75-65-0	42
TERT-BUTYL ALCOHOL	75-65-0	67
T-BUTYLATED HYDROXY-ANISOL (BHA)		109
BUTYLATED HYDROXYTOLUENE	128-37-0	48
BUTYLATED HYDROXYTOLUENE (BHT)	128-37-0	80
T-BUTYLATED HYDROXYTOLUENE (BHT)	128-37-0	109
BUTYL BENZYL PHTHALATE	85-68-7	42
BUTYL BENZYL PHTHALATE	85-68-7	48
N-BUTYL CHLORIDE	109-69-3	42
TERT-BUTYL CHROMATE	1189-85-1	25
N-BUTYL GLYCIDYL ETHER	2426-08-6	25
T-BUTYL GLYCIDYL ETHER	7665-72-7	25
N-BUTYL NITRITE	544-16-1	14
N-BUTYL NITRITE	544-16-1	16
SEC-BUTYL NITRITE	924-43-6	14
4-TERTIARY-BUTYL-NITROSOPIPERIDINE	46061-25-0	6
TERT-BUTYL PERBENZOATE	614-45-9	42
TERT-BUTYL PERBENZOATE	614-45-9	36
TERT-BUTYLPERBENZOATE	614-45-9	22
T-BUTYL PHENYL GLYCIDYL ETHER	3101-60-8	25
BUTYRALDEHYDE	123-72-8	42
BUTYRALDEHYDE	123-72-8	42
BUTYRALDEHYDE	123-72-8	67
BUTYRIC ACID	107-92-6	25
GAMMA-BUTYROLACTONE	96-48-0	36
GAMMA-BUTYROLACTONE	96-48-0	42
BV-ARA-U		93
BVDU (BROMOVINYLDEOXYURIDINE)	69304-47-8	93
BVDU (BROMOVINYLDEOXYURIDINE)	69304-47-8	93
CADMIUM	7440-43-9	51
CADMIUM	7440-43-9	74
CADMIUM	7440-43-9	117
CADMIUM	7440-43-9	117
CADMIUM CHLORIDE	10108-64-2	48
CADMIUM CHLORIDE	10108-64-2	51
CADMIUM (COMPOUNDS)		97
CADMIUM METALLOTHIONEN		51
CADMIUM SULFIDE		110
CAFFEIC ACID	331-39-5	14
CAFFEINE	58-08-2	51
CAFFEINE	58-08-2	51
CAFFEINE	58-08-2	51
CAFFEINE	58-08-2	51
CAFFEINE	58-08-2	76

263<

CHEMICAL INDEX

CHEMICAL	CAS NO.	PAGE
CAFFEINE	58-08-2	76
CAFFEINE	58-08-2	76
CAFFEINE	58-08-2	99
CALCIUM	7440-20-2	97
CALCIUM	7440-70-2	98
CALCIUM	7440-70-2	117
CALCIUM, ALSO POTASSIUM AND SODIUM		78
CALCIUM CHROMATE	13765-19-0	36
CALCIUM CHROMATE	13765-19-0	48
CALCIUM IONOPHORE		110
CALCIUM NAPHTHENATE	61789-36-4	14
CALMODULIN		110
CANNABINOIDS		110
CANNABINOIDS		110
CANNABINOL		76
CARBACHOL	51-83-2	99
CARBAMAZEPINE	298-46-4	95
CARBAMAZEPINE	298-46-4	99
CARBAMAZEPINE	298-46-4	99
CARBAMAZEPINE	298-46-4	99
CARBARSONE	121-59-5	25
4-(3-CARBAZOL-3-YL-AMINO)PHENOL	86-72-6	25
CARBON	7440-44-0	97
CARBON		99
CARBON	7440-44-0	100
CARBON	7440-44-0	101
CARBON	7440-44-0	103
CARBON	7440-44-0	105
CARBON	7440-44-0	107
CARBON DISULFIDE	75-15-0	36
CARBON DISULFIDE	75-15-0	67
CARBON DISULFIDE	75-15-0	67
CARBON DISULFIDE	75-15-0	74
CARBON MONOXIDE	630-08-0	119
CARBON MONOXIDE	630-08-0	119
CARBON TETRACHLORIDE	56-23-5	25
CARBON TETRACHLORIDE	56-23-5	88
CARBON TETRACHLORIDE	56-23-0	119
CARBON TETRACHLORIDE	56-23-5	119
CARBOXYLIC ACIDS		78
CARBROMAL	77-65-6	36
CARISOPRODOL	78-44-4	36
CARISOPRODOL	78-44-4	42
CARMINIC ACID	1260-17-9	25
CARMINIC ACID	1260-17-9	16
CARMINIC ACID	1260-17-9	14
BETA-CAROTENE	7235-40-7	113
D-CARVONE	2244-16-8	42

CHEMICAL	CAS NO.	PAGE
CASTOR OIL	8001-79-4	42
CATECHOLAMINES	9012-25-3	98
CATECHOLAMINES		102
CATECHOLAMINES		102
CATECHOLAMINES		113
CEFAZOLIN		110
CENTRALLY ACTING DRUGS		103
CEPHEMS		99
CF3DURD		93
CHAVICOL	501-92-8	14
CHEMICAL PROMUTAGENS		20
CHIRIQUITOXIN	61132-15-8	99
CHLORAL HYDRATE	302-17-0	36
CHLORAMBEN	133-90-4	36
CHLORAMBUCIL	305-03-3	36
CHLORAMINE	10599-90-3	42
CHLORAMINE	10599-90-3	119
CHLORAMPHENICOL	56-75-7	74
CHLORAMPHENICOL SODIUM SUCCINATE	982-57-0	40
CHLORCYCLIZINE	82-93-9	80
CHLORDANE	12789-03-6	36
CHLORDANE (TECHNICAL GRADE)	12789-03-6	48
CHLORDIAZEPOXIDE	58-25-3	9
CHLORENDIC ACID	115-28-6	36
CHLORENDIC ACID	115-28-6	42
CHLORIMIPRAMINE	303-49-1	81
CHLORINATED BIPHENYLS		114
CHLORINATED TRISODIUM PHOSPHATE	56802-99-4	36
CHLORINATED TRISODIUM PHOSPHATE	56802-99-4	42
CHLORINATION BI-PRODUCTS		119
CHLORINE (CHLORINATED DRINKING WATER)	7990-92-3	119
CHLORINE (CHLORINATED DRINKING WATER)	7990-92-3	119
CHLORINE DIOXIDE	10049-04-4	119
CHLORINE GAS	7782-50-5	81
CHLOROACETOPHENONE	532-27-4	43
4-(CHLOROACETYL-ACETANILIDE	140-49-8	36
4-(CHLOROACETYL)ACETANILIDE	140-49-8	25
N-(3-CHLOROALLYL)HEXAMINIUM CHLORIDE	4080-31-3	25
P-CHLORO-ALPA,ALPHA,ALPHA-TRIFLUOROTOLUENE	98-56-6	14
P-CHLORO-ALPHA,ALPHA,ALPHATRIFLUOROTOLUENE	98-56-6	16
P-CHLOROANILINE	106-47-8	43
P-CHLOROANILINE	106-47-8	48
O-CHLOROBENZALMALONITRILE	2698-41-1	43
CHLOROBENZENE	108-90-7	36
CHLOROBENZILATE	510-15-6	48
4-CHLORO-2-(2,4-DINITROANILINO)PHENOL	6358-18-5	25
2-CHLOROETHYLTRIMETHYLAMMONIUM CHLORIDE	999-81-5	36
CHLOROFORM	67-66-3	86

CHEMICAL INDEX

CHEMICAL	CAS NO.	PAGE
CHLOROGENIC ACID	327-97-1	14
3-CHLORO-2-METHYLPROPENE	563-47-3	36
3-CHLORO-2-METHYLPROPENE	563-47-3	43
3-CHLOROMETHYLPYRIDINE HYDROCHLORIDE	6959-48-4	48
CHLORONEB	2675-77-6	25
4-CHLORO-2-NITROANILINE	89-63-4	43
4-CHLORO-2-NITROANILINE	89-63-4	48
1-CHLORO-1-NITROPROPANE	600-25-9	25
2-CHLORO-2-NITROPROPANE	594-71-8	25
3-CHLORONITROSOPIPERIDINE	65445-60-5	2
4-CHLORONITROSOPIPERIDINE	65445-61-6	2
CHLOROPRENE	126-99-8	36
2-CHLORO-1,3-PROPANEDIOL	497-04-1	25
1-CHLORO-2-PROPANOL	127-00-4	25
1-CHLORO-2-PROPANOL	127-00-4	40
2-CHLORO-1-PROPANOL	78-89-7	25
3-CHLORO-1-PROPANOL	627-30-5	25
5-CHLOROPYRIMIDINES		20
O-CHLOROSTYRENE	2039-87-4	25
CHLOROTHALONIL	1897-45-6	48
CHLOROTHEN	148-65-2	9
CHLOROTHIAZIDE	58-94-6	25
CHLOROTHIOFORMIC ACID	EMTDP-49	25
5-CHLORO-O-TOLUIDINE	95-79-4	48
CHLOROWAX 40	63449-39-8	43
CHLOROWAX 40	63449-39-8	56
CHLOROWAX 500C	63449-39-8	43
CHLOROWAX 500C	63449-39-8	56
CHLORPHENIRAMINE MALEATE	113-92-8	9
CHLORPHENIRAMINE MALEATE	113-92-8	9
CHLORPHENIRAMINE MALEATE	113-92-8	36
CHLORPHENIRAMINE MALEATE	113-92-8	43
CHLORPHENIRAMINE MALEATE	113-92-8	48
CHLORPHENTERMINE	461-78-9	81
CHLORPROMAZINE	50-53-3	81
CHLORPROMAZINE	50-53-3	88
CHLORPROMAZINE	50-53-3	99
CHLORPROPAMIDE	94-20-2	36
CHOLERA TOXIN		99
CHOLERA TOXIN ADENINE NUCLEOTIDES		94
CHOLESTEROL	57-88-5	99
CHOLESTEROL	57-88-5	99
CHOLESTEROL	57-88-5	99
CHOLESTEROL-5-ALPHA,6-ALPHA-EPOXIDE	1250-95-9	14
CHOLESTEROL OXIDES		51
CHOLESTYRAMINE	11041-12-6	16
CHOLESTYRAMINE	11041-12-6	14
CHOLINE		104
CHROMIUM CARBONYL	13007-92-6	25
CHROMIUM CARBONYL	13007-92-6	36
CHROMIUM HEXACARBONYL	13007-92-6	14
CHRYSENE-TRANS-3,4-DIHYDRODIOL		56
CHRYSENE-TRANS-3,4-DIHYDRODIOL		56
C.I. ACID BASIC RED 18	14097-03-1	16
C.I. ACID BLUE 74	860-22-0	14
C.I. ACID ORANGE 10	1936-15-8	14
C.I. ACID RED 14	3567-69-9	36
C.I. ACID RED 114	6459-94-5	43
C.I. ACID YELLOW 151	12715-61-6	14
C.I. ACID YELLOW 151	12715-61-6	16
C.I. BASIC ORANGE 2	532-82-1	40
C.I. BASIC RED 9	569-61-9	43
C.I. BASIC RED 18	14097-03-1	14
C.I. DIRECT BLACK 114	61703-05-7	25
C.I. DIRECT BLUE 15	2429-74-5	43
C.I. DIRECT BLUE 218	28407-37-6	43
C.I. DIRECT ORANGE 6	6637-88-3	25
C.I. DIRECT RED 80	2610-10-8	14
C.I. DIRECT RED 80	2610-10-8	16
C.I. DIRECT YELLOW 4	91-34-9	16
C.I. DIRECT YELLOW 4	91-34-9	14
C.I. DIRECT YELLOW 11	1325-37-7	43
C.I. DISPERSE BLUE 27	15791-78-3	25
C.I. DISPERSE BROWN 1	23355-64-8	16
C.I. DISPERSE BROWN 1	23355-64-8	14
C.I. PIGMENT ORANGE 7	5850-81-7	25
C.I. PIGMENT RED 2	6041-94-7	25
C.I. PIGMENT RED 3	2425-85-6	43
C.I. PIGMENT RED 8	6410-30-6	25
C.I. PIGMENT RED 23	6471-49-4	43
C.I. PIGMENT RED 69	5850-90-8	25
C.I. SOLVENT ORANGE 7	3118-97-6	14
C.I. SOLVENT YELLOW 5	85-84-7	14
1,8-CINEOLE	470-82-6	56
1,8-CINEOLE	470-82-6	56
1,8-CINEOLE	470-82-6	56
1,8-CINEOLE	470-82-6	56
CINNAMALDEHYDE	104-55-2	56
CINNAMALDEHYDE	104-55-2	67
CINNAMALDEHYDE ETHYLENE GLYCOL ACETAL	5660-60-6	25
CITRAL	5392-40-5	43
CITRAL	5392-40-5	67
CITRININ	518-75-2	51
CLOFIBRATE	637-07-0	56
CLOFIBRATE	637-07-0	56
CLOFIBRATE	637-07-0	56

CHEMICAL INDEX

CHEMICAL	CAS NO.	PAGE
CLOFIBRATE	637-07-0	56
CLOMID		70
CLOMIPHENE	911-45-5	56
CLOMIPHENE CITRATE	50-41-9	71
CLONITRALID	1420-04-8	25
CLOROPROCAINE		102
COAGULANTS, COAGULANT AIDS		119
COAL COMBUSTION PRODUCTS		117
COAL DUST/FLY ASH PARTICULATES		117
COAL GASIFICATION MATERIALS		117
COAL LIQUEFACTION MATERIALS		117
COAL LIQUEFACTION MATERIALS		117
COAL LIQUEFACTION MATERIALS		117
COAL LIQUEFACTION MATERIALS		117
COAL LIQUEFACTION MATERIALS		118
COAL TAR		120
COBALT NAPHTHENATE	61789-51-3	14
COBALTOCENE	1277-43-6	25
COCONUT DIETHANOLAMIDE	68603-42-9	48
COCONUT OIL ACID (2 PARTS)-DIETHANOLAMINE (1 PART)	68603-42-9	43
CODEINE	76-57-3	43
COFFEE DUST		81
COLCHICINE	64-86-8	99
COLCHICINE	64-86-8	99
COLCHICINE	64-86-8	100
COMBUSTION FLY ASH		118
COMFREY ROOT, DOMESTIC		51
COMFREY ROOT, IMPORTED		51
CONTRACEPTIVE ESTROGENS AND PROGESTINS		73
CONTRACEPTIVE ESTROGENS AND PROGESTINS		73
CONTRACEPTIVE ESTROGENS AND PROGESTINS		73
CONTRACEPTIVE PROGESTINS		73
CONTRACEPTIVE PROGESTINS		73
CONTRACEPTIVE SPERMICIDES		73
CONVULSANTS		94
CONVULSANTS		103
COPPER		51
COPPER NAPHTHENATE	1338-02-9	14
COPPER SLAGS	7440-50-8	67
CORTICOSTEROIDS		81
CORTICOSTEROIDS		81
CORTISOL	50-23-7	56
CORTISONE	53-06-5	113
CORTISONE	53-06-5	113
CORTISONE ACETATE		113
COTTON DUST		81
COTTON DUST		81
COUMAPHOS	56-72-4	25

CHEMICAL	CAS NO.	PAGE
COUMAPHOS	56-72-4	36
COUMAPHOS	56-72-4	48
COUMARIN	91-64-5	43
M-CRESIDINE	102-50-1	25
P-CRESIDINE	120-71-8	26
O-CRESYL GLYCIDYL ETHER	2210-79-9	26
CROTONALDEHYDE	4170-30-3	22
CROTONALDEHYDE	4170-30-3	43
CROTONALDEHYDE	4170-30-3	43
CROTONALDEHYDE	4170-30-3	67
4-CUMYLPHENYLDIPHENYL PHOSPHATE (CPDPP MIXED ISOMERS)	50851-28-0	26
P-CUMYL PHENYL GLYCIDYL ETHER	61578-04-9	26
CYANIDE		78
CYANIDES		104
CYCLIC AMP	60-92-4	100
CYCLIZINE	82-92-8	81
CYCLOHEXAMINE	2201-15-2	78
1,2-CYCLOHEXANEDICARBOXYLIC ACID, BIS(OXIRANYLMETHYL) ESTER	5493-45-8	26
CYCLOHEXANONE	108-94-1	43
CYCLOHEXIMIDE	66-81-9	26
4-CYCLOHEXYLNITROSOPIPERIDINE	75881-21-9	2
CYCLOPHOSPHAMIDE	50-18-0	36
CYCLOPHOSPHAMIDE	50-18-0	56
CYCLOPHOSPHAMIDE	50-18-0	74
CYCLOPHOSPHAMIDE	50-18-0	81
CYCLOPHOSPHAMIDE	50-18-0	88
CYCLOPHOSPHAMIDE (TOXIC METABOLITES)	50-18-0	100
CYCLOSPORIN A	59865-13-3	36
CYCLOSPORIN A	59865-13-3	26
CYSTEAMINE	60-23-1	77
CYSTEAMINE	60-23-1	89
CYSTEAMINE	60-23-1	89
L-CYSTEINE	52-90-4	14
L-CYSTEINE	52-90-4	16
L-CYSTEINE, ETHYL ESTER, METHYL CARBAMATE (ESTER), METHYL CARBAMATE (ESTER), MONOHYDROCHLORIDE	51785-99-0	19
CYTARABINE	147-94-4	26
CYTEMBENA	21739-91-3	26
CYTOCHALASIN	37187-49-8	100
CYTOCHALASIN	37187-49-8	100
CYTOCHALASIN	37187-49-8	100
CYTOCHALASIN B		110
CYTOCHALASIN D	14930-96-2	74
CYTOCHALASIN D	14930-96-2	110
CYTOXAN	50-18-0	113
DAUNOMYCIN	20830-81-3	86
DAUNORUBICIN	20830-81-3	65

CHEMICAL INDEX

CHEMICAL	CAS NO.	PAGE
DAUNORUBICIN	20830-81-3	65
DAUNORUBICIN	20830-81-3	87
DAUNORUBICIN	20830-81-3	87
DAUNORUBICIN	20830-81-3	110
D AND C ORANGE		51
D AND C RED 9	5160-02-1	51
D AND C YELLOW NO. 11	8003-22-3	26
DDT	50-29-3	69
DDT	50-29-3	100
DEANOL ACETAMIDOBENZOATE	3635-74-3	100
DEAZUPURINE ANALOGS		93
DECABROMOBIPHENYL OXIDE	1163-19-5	22
DECABROMODIPHENYL OXIDE	1163-19-5	36
DECABROMODIPHENYL OXIDE	1163-19-5	43
DECANOIC ACID	334-48-5	26
DECOYININE	2004-04-8	94
DEHYDROEMETINE HYDROCHLORIDE	4914-30-1	26
DEMECOLCINE	477-30-5	100
DEMETHYLCHLORTETRACYCLINE	127-33-3	89
DEMETON	8065-48-3	100
4-(DEOXYADENOSIN-6-YL)4-AMINOBIPHENYL		56
4-(DEOXYADENOSIN-6-YL)-2-NAPHTHYLAMINE		56
DEOXYGLUCOSE		100
3-(DEOXYGUANOSINE-N2-YL)-2-ACETYLAMINOFLUORENE		56
N-(DEOXYGUANOSINE-8-YL)-2-ACETYLAMINOFLUORENE		56
N-(DEOXYGUANOSINE-8-YL)-4-AMINOBIPHENYL		56
N-(DEOXYGUANOSINE-8-YL)-2-AMINOFLUORENE		56
N-(DEOXYGUANOSINE-8-YL)-1-AMINOPYRENE		56
DEOXYSPERGUALIN		19
DESIPRAMINE	50-47-5	87
3-DEUTERO-6-AMINOBENZO(A)PYRENE		56
3-DEUTERO-6-AMINOBENZO(A)PYRENE		56
3-DEUTERO-6-AMINOBENZO(A)PYRENE		56
3-DEUTERO-6-METHYLBENZO(A)PYRENE		56
3-DEUTERO-6-METHYLBENZO(A)PYRENE		56
3-DEUTERO-6-METHYLBENZO(A)PYRENE		56
1-DEUTERO-NAPHTHALENE		56
DEUTERO-6-NITROBENZO(A)PYRENE		57
DEUTERO-6-NITROBENZO(A)PYRENE		57
DEUTERO-6-NITROBENZO(A)PYRENE		57
DEXAMETHASONE	50-02-2	57
DEXAMETHASONE	50-02-2	57
DEXAMETHASONE	50-02-2	110
DHPG		93
DHPG		93
DHPG		93
DHPG		93
N,N-DIACETYL-4-AMINOBENZO(A)PYRENE	82507-24-2	57

CHEMICAL	CAS NO.	PAGE
N,N-DIACETYL-4-AMINOBENZO(A)PYRENE	82507-24-2	57
N,N-DIACETYL-4-AMINOBENZO(A)PYRENE	82507-24-2	57
3',5'DI-O-ACETYL-5-IODO-2'-DEOXYCYTIDINE		110
DIALLYL PHTHALATE	131-17-9	48
2,4-DIAMINOANISOLE SULFATE	39156-41-7	26
2,4-DIAMINOPHENOL DIHYDROCHLORIDE	137-09-7	43
4,4'-DIAMINO-2,2'-STILBENEDISULFONIC ACID	81-11-8	43
3,4-DIAMINOTOLUENE	496-72-0	26
DIARYLANILIDE YELLOW	6358-85-6	36
DIAZACHOLESTEROL	313-05-3	100
20,25-DIAZACHOLESTEROL	313-05-3	100
DIAZEPAM	439-14-5	100
DIAZEPAM	439-14-5	100
DIAZINON	333-41-5	36
DIAZINON	333-41-5	48
DIBENZ(A)ANTHRACENE-TRANS-3,4-DIHYDRODIOL	66267-19-4	57
DIBENZ(A)ANTHRACENE-TRANS-3,4-DIHYDRODIOL	66267-19-4	57
DIBROMOACETALDEHYDE	3039-13-2	26
2,3-DIBROMO-2-BUTENE-1,4-DIOL	3234-02-4	40
DIBROMOCHLOROPROPANE	96-12-8	89
1,2-DIBROMO-3-CHLOROPROPANE	96-12-8	37
1,2-DIBROMO-3-CHLOROPROPANE	96-12-8	21
1,2-DIBROMO-4-(1,2-DIBROMOETHYL)CYCLOHEXANE	3322-93-8	37
DIBROMOETHANE	106-93-4	57
DIBROMOMANNITOL	488-41-5	37
2,3-DIBROMO-1-PROPANOL	96-13-9	43
1,3-DI((N-(4,6-DIMETHYL-2-PYRIMIDINYL)-4-SULFAMOYLPHENYL))-DI-SEC-BUTANOLAMINE		57
DI-SEC-BUTANOLAMINE	21838-75-5	26
N,N'-DI-SEC-BUTYL-P-PHENYLDIAMINE	101-96-2	28
DIBUTYL PHENYL PHOSPHATE	2528-36-1	26
DIBUTYLTIN DIACETATE	1067-33-0	37
DIBUTYLTIN DIACETATE	1067-33-0	48
DICALCIUM PHOSPHATE DIHYDRATE	7757-93-9	113
DICHLORAN	99-30-9	40
DICHLORAN	99-30-9	26
DICHLOROACETALDEHYDE	79-02-7	26
DICHLOROACETONITRILE	3018-12-0	37
P-DICHLOROBENZENE	106-46-7	43
P-DICHLOROBENZENE	106-46-7	48
1,2-DICHLOROBENZENE (O-DICHLOROBENZENE)	95-50-1	48
3,4-DICHLORONITROBENZENE	99-54-7	37
3,3'-DICHLOROBENZIDINE	92-87-5	58
DICHLOROBENZOIC ACIDS		100
5,6-DICHLORO-2-BENZOTHIAZOLAMINE	24072-75-1	26
CIS-DICHLORODIAMINE PLATINUM	15663-27-1	94
CIS-DICHLORODIAMINE PLATINUM	15663-27-1	114
1,3-DICHLORO-5,5'-DIMETHYLHYDANTOIN	118-52-5	22

267<

CHEMICAL INDEX

CHEMICAL	CAS NO.	PAGE
DICHLORODIPHENYLETHYLENE	72-55-9	21
DICHLORODIPHENYLETHYLENE	72-55-9	48
1,2-DICHLOROETHANE	107-06-3	67
CIS-1,2-DICHLOROETHYLENE	156-59-2	26
DICHLOROMETHANE (METHYLENE CHLORIDE)	75-09-2	48
4,5-DICHLORO-6-METHYL-2-METHYLSULFONYLPYRIMIDINE	17901-16-5	26
2,3-DICHLORONITROBENZENE	3209-22-1	37
2,4-DICHLORONITROBENZENE	611-06-3	37
2,4-DICHLOROPHENOL	120-83-2	43
2,4-DICHLOROPHENOXYACETATE		100
1,3-DICHLORO-2-PROPANOL	96-23-1	26
1,3-DICHLOROPROPENE (TELONE II)	542-75-6	37
2,3-DICHLOROPROPYLENE	78-88-6	26
DICHLORVOS	62-73-7	26
DICHLORVOS	62-73-7	43
N,N'-DICYCLOHEXYLTHIOUREA	1212-29-9	48
DIELDRIN	60-57-1	37
DIESEL FUEL MARINE		43
DIETHANOLAMINE	111-42-2	37
DIETHANOLAMINE	111-42-2	43
DIETHANOLAMINE	111-42-2	48
DIETHANOLAMINE	111-42-2	67
DIETHYLAMINE	109-89-7	78
5-DIETHYLAMINO-2-NITROSO-4-METHYLPHENOL	6265-09-4	26
5-DIETHYLAMINO-2-NITROSOPHENYL HCL	25953-06-4	26
3-DIETHYLAMINOPHENOL	91-68-9	26
N,N'-DIETHYLCARBANILIDE	85-98-3	26
DIETHYLDICHLOROSILANE	1719-53-5	26
DIETHYLENE GLYCOL BIS-GLYCIDYL ETHER	4206-61-5	26
DI(2-ETHYLHEX-YL)ADIPATE	103-23-1	48
2,2'-DIETHYLHEXYLAMINE	106-20-7	26
DIETHYLNITROSAMINE	55-18-5	2
DIETHYLNITROSAMINE	55-18-5	7
DIETHYLNITROSAMINE	55-18-5	7
DIETHYLNITROSAMINE	55-18-5	7
DIETHYLNITROSAMINE-F6		2
DIETHYLNITROSOMETHYLUREA		8
DIETHYLNITROSOMETHYLUREA		2
DIETHYLNITROSOMETHYL-D3-UREA		2
N,N-DIETHYL-4-((5-NITRO-2THIAZOLYL)AZO) BENZENAMINE	54289-46-2	26
N,N-DIETHYL-P-PHENYLENEDIAMINE	93-05-0	26
DIETHYL PHTHALATE	84-66-2	43
DIETHYLSTILBESTROL	56-53-1	57
DIETHYLSTILBESTROL	56-53-1	57
DIETHYLSTILBESTROL	56-53-1	57
DIETHYLSTILBESTROL	56-53-1	70
DIETHYLSTILBESTROL	56-53-1	70
DIETHYLSTILBESTROL	56-53-1	94

CHEMICAL	CAS NO.	PAGE
N,N'-DIETHYLTHIOUREA	105-55-5	48
N,N-DIETHYL-M-TOLUAMIDE	134-62-3	67
DIGITALIS		78
DIGITONIN	11024-24-1	26
DIGLYCIDYL RESORCINOL ETHER	101-90-6	48
3,4-DIHYDROCOUMARIN	119-84-6	43
DIHYDROTRIAZINE	31368-48-6	19
1,2-DIHYDRO-2,2,4-TRIMETHYLQUINOLINE	147-47-7	43
3,3'-DIHYDROXYBENZIDINE	2373-98-0	27
1,8-DIHYDROXY-4,5-DINITROANTHRAQUINONE	81-55-0	40
1,8-DIHYDROXY-4,5-DINITROANTHRAQUINONE	81-55-0	37
5,6-DIHYDROXYTRYPTAMINE	5090-36-8	100
DIHYDROXYUREA	686-68-0	27
DI(ISOPROPYLPHENYL)PHENYL PHOSPHATE (DIPP)	28109-00-4	27
DILANTIN	57-41-0	76
DIMETHOXANE	828-00-2	44
2,3-DIMETHOXYANILINE HYDROCHLORIDE	54150-69-5	27
2,4-DIMETHOXYANILINE HYDROCHLORIDE	54150-69-5	48
2,4-DIMETHOXYANILINE HYDROCHLORIDE	54150-69-5	37
DIMETHOXYBENZIDINE	119-90-4	57
3,3'-DIMETHOXYBENZIDINE	119-90-4	44
4,4'-DIMETHOXYDIPHENYLAMINE	101-70-2	27
4-DIMETHYLAMINOAZOBENZENE	60-11-7	27
N,N-DIMETHYL-4-AMINOBENZENE		57
2-(DIMETHYLAMINOETHYLAMINO)PYRIDINE	23826-72-4	57
3-DIMETHYLAMINO-4-METHYLPHENOL	119-31-3	27
5-DIMETHYLAMINO-2-NITROSO-4-METHYLPHENOL	6265-11-8	27
P-N,N-DIMETHYLAMINOPHENETHANOL	50438-75-0	14
N,N-DIMETHYLANILINE	121-69-7	37
N,N-DIMETHYLANILINE	121-69-7	44
DIMETHYLBENZANTHRACENE	57-97-6	57
DIMETHYLBENZANTHRACENE	57-97-6	57
DIMETHYLBENZANTHRACENE	57-97-6	57
DIMETHYLBENZANTHRACENE	57-97-6	113
7,12-DIMETHYLBENZ(A)ANTHRACENE	57-97-6	57
3,3'-DIMETHYLBENZIDINE	119-93-7	44
3,3'-DIMETHYLBENZIDINE	119-93-7	57
3,3'-DIMETHYLBENZIDINE DIHYDROCHLORIDE	612-82-8	27
TRANS-1,3-DIMETHYLCYCLOPENTANE	1759-58-6	27
DIMETHYLDINITROSOPIPERAZINE	55380-34-2	7
DIMETHYLDINITROSOPIPERAZINE	55380-34-2	7
DIMETHYLDINITROSOPIPERAZINE	55380-34-2	7
2,6-DIMETHYLDINITROSOPIPERAZINE	55380-34-2	2
2,6-DIMETHYLDINITROSOPIPERAZINE	55380-34-2	8
2,6-DIMETHYLDINITROSOPIPERAZINE	55380-34-2	17
2,6-DIMETHYLDINITROSOPIPERAZINE-D4		2
DIMETHYLDODECYLAMINE OXIDE	1643-20-5	9
DIMETHYLDODECYLAMINE OXIDE	1643-20-5	9

CHEMICAL INDEX

CHEMICAL	CAS NO.	PAGE
DIMETHYLETHANOLAMINE	108-01-0	40
DIMETHYLFORMAMIDE	68-12-2	37
DIMETHYLFORMAMIDE	68-12-2	67
DIMETHYLFORMAMIDE	68-12-2	57
N-(2,2-DIMETHYL-HYDROXYETHYL)-4-METHYLBENZAMIDE		57
1,1-DIMETHYL-1-(2-HYDROXYPROPYLAMINE)TETRADECANIMIDE	38848-76-9	27
DIMETHYL METHYLPHOSPHONATE	756-79-6	40
DIMETHYL METHYLPHOSPHONATE	756-79-6	44
DIMETHYL MORPHOLINOPHOSPHORAMIDATE	597-25-1	40
DIMETHYL MORPHOLINOPHOSPHORAMIDATE	597-25-1	44
1,2-DIMETHYL-3-NITROBENZENE	83-41-0	27
1,2-DIMETHYL-4-NITROBENZENE	99-51-4	27
1,3-DIMETHYL-2-NITROBENZENE	81-20-9	27
1,3-DIMETHYL-4-NITROBENZENE	89-87-2	27
1,3-DIMETHYL-5-NITROBENZENE	99-12-7	27
1,4-DIMETHYL-2-NITROBENZENE	89-58-7	27
DIMETHYLNITROSAMINE	62-75-9	57
DIMETHYLNITROSAMINE	62-75-9	89
2,6-DIMETHYLNITROSOMORPHOLINE	1456-28-6	2
2,6-DIMETHYLNITROSOMORPHOLINE	1456-28-6	8
2,6-DIMETHYLNITROSOMORPHOLINE	1456-28-6	17
2,6-DIMETHYLNITROSOMORPHOLINE-D2		2
2,6-DIMETHYLNITROSOMORPHOLINE-D4		2
2,6-DIMETHYLNITROSOMORPHOLINE-ISOMER A	69091-15-2	2
2,6-DIMETHYLNITROSOMORPHOLINE-ISOMER C	69091-16-3	2
2,6-DIMETHYL-4-NITROSOPIPERAZINE	67774-31-6	2
3,5-DIMETHYLNITROSOPIPERIDINE	65445-59-2	2
3,5-DIMETHYLNITROSOPIPERIDINE-ISOMER A	78338-31-5	2
3,5-DIMETHYLNITROSOPIPERIDINE-ISOMER B	78338-32-6	2
DIMETHYLOLDIHYDROXYETHYLENEUREA	1854-26-8	40
DIMETHYLOLDIHYDROXYETHYLENEUREA	1854-26-8	44
N,N-DIMETHYL-P-PHENYLENEDIAMINE	93-98-9	27
DIMETHYL PHTHALATE	131-11-3	44
DIMETHYL PHTHALATE	131-11-3	67
DIMETHYL SULFOXIDE	67-68-5	27
DIMETHYL TEREPHTHALATE	120-61-6	37
N,N-DIMETHYL-P-TOLUIDINE	99-97-8	14
DIMETHYLVINYL CHLORIDE	513-37-1	40
DIMETHYLVINYL CHLORIDE	513-37-1	44
N,N'-DI-2-NAPTHYL-P-PHENYLENEDIAMINE	93-46-9	27
2,4-DINITROANILINE	97-02-9	27
2,4-DINITROANILINE	97-02-9	37
2-(2,4-DINITROANILINO)PHENOL	6358-23-2	27
2,5-DINITRO-9H-FLUORENE	15110-74-4	27
2,7-DINITRO-9H-FLUOREN-9-ONE	31551-45-8	27
2,7-DINITRO-9H-FLUOREN-9-ONE	31551-45-8	37
2,4-DINITRO-6-(1-METHYLHEPTYL)-PHENOL	3687-22-7	27
1,3-DINITRONAPHTHALENE	606-37-1	27

CHEMICAL	CAS NO.	PAGE
1,5-DINITRONAPHTHALENE	605-71-0	27
1,8-DINITRONAPHTHALENE	602-38-0	27
2,4-DINITROPHENOL	51-28-5	27
DINITROPYRENE		57
1,3-DINITROPYRENE	75321-20-9	57
1,6-DINITROPYRENE	42397-64-8	58
1,8-DINITROPYRENE	42397-65-9	58
(3H)-1,3-DINITROPYRENE		58
(3H)-1,6-DINITROPYRENE		58
(3H)-1,8-DINITROPYRENE		58
DINITROSOHOMOPIPERAZINE	55557-00-1	2
2,4-DINITROTOLUENE	121-14-2	37
4,4'-DIOCTYLDIPHENYLAMINE	101-67-7	27
1,5,2,4-DIOXADITHIEPANE,2,2,4,4-TETRAOXIDE		19
DIOXANE	123-91-1	51
1,4-DIOXANE	123-91-1	49
DIOXINE		53
DIPHENHYDRAMINE HYDROCHLORIDE	147-24-0	9
DIPHENHYDRAMINE HYDROCHLORIDE	147-24-0	9
DIPHENHYDRAMINE HYDROCHLORIDE	147-24-0	37
DIPHENHYDRAMINE HYDROCHLORIDE	147-24-0	44
DIPHENHYDRAMINE HYDROCHLORIDE	147-24-0	49
1,3-DIPHENYLGUANIDINE	102-06-7	14
1,3-DIPHENYLGUANIDINE	102-06-7	16
DIPHENYLHYDANTOIN	57-41-0	44
DIPHENYLHYDANTOIN	57-41-0	58
DIPHENYLHYDANTOIN	57-41-0	58
DIPHENYLHYDANTOIN	57-41-0	58
DIPHENYLHYDANTOIN	57-41-0	58
DIPHENYLHYDANTOIN	57-41-0	96
DIPHENYLHYDANTOIN	57-41-0	99
DIPHENYLHYDANTOIN	57-41-0	99
DIPHENYLHYDANTOIN	57-41-0	100
DIPHENYLHYDANTOIN	57-41-0	100
DIPHENYLHYDANTOIN	57-41-0	102
DIPHENYLHYDANTOIN	57-41-0	108
DIPHENYLHYDANTOIN	57-41-0	113
DIPHENYLHYDANTOIN	57-41-0	113
DIPHENYLHYDANTOIN	57-41-0	113
N,N'-DIPHENYL-P-PHENYLENEDIAMINE	74-31-7	27
ASYM-DIPHENYLUREA	603-54-3	28
DIPHTHERIA TOXINS		100
DIPROPYLACETIC ACID	99-66-1	100
DIPYRIDAMOLE	58-32-2	100
DIRECT BLACK, BENZIDINE	1937-37-7	58
DIRECT RED 2	992-59-6	58
DISPERSE BLUE NO. 1	2475-45-8	44
1,3-DI(4-SULFAMOYLPHENYL)TRIAZINE		58

CHEMICAL INDEX

CHEMICAL	CAS NO.	PAGE
DISULFIRAM	97-77-8	9
DIURETICS		98
DIURETICS		98
DMBA	57-97-6	44
DMBA/TPA/BPO (7,12-DIETHYLBENZ(A)ANTH	57-97-6	44
DNP-LYSINE		101
N-DODECYLMERCAPTAN	112-55-0	14
N-DODECYLMERCAPTAN	112-55-0	16
DOPA	59-92-7	101
DOPA	59-92-7	101
DOPA	59-92-7	107
DOPAMINE	51-61-6	89
DOPAMINE	51-61-6	95
DOPAMINE	51-61-6	99
DOPAMINE	51-61-6	101
DOPAMINE	51-61-6	101
DOPAMINE	51-61-6	107
DOXORUBICIN	23214-92-8	65
DOXORUBICIN	23214-92-8	65
DOXYLAMINE	469-21-6	58
DOXYLAMINE	469-21-6	58
DOXYLAMINE	469-21-6	58
DOXYLAMINE (14-C)	469-21-6	58
DRINKING WATER CONTAMINANTS		120
EA RESIN	30999-33-8	101
ECHOTHIOPATE		110
ECONAZOLE	27220-47-9	28
ELLAGIC ACID DIHYDRATE	476-66-4	16
ELLAGIC ACID DIHYDRATE	476-66-4	14
BETA-ENDORPHIN	61214-51-5	70
ENDRIN	72-20-8	39
ENDRIN	72-20-8	49
ENFLUREANE	13838-16-9	89
ENKEPHALIN	59141-40-1	107
ENVIRONMENTAL AGENTS		70
EPHEDRINE	299-42-3	65
EPHEDRINE SULFATE	134-72-5	49
EPHEDRINE SULFATE	134-72-5	37
EPHEDRINE SULFATE	134-72-5	44
EPIBROMOHYDRIN	3132-64-7	40
EPICHLOROHYDRIN	106-89-8	89
EPINEPHRINE	51-43-4	28
EPINEPHRINE	51-43-4	102
EPINEPHRINE HYDROCHLORIDE	55-31-2	44
1,2-EPOXYBUTANE	106-88-7	44
1,2-EPOXYBUTANE	106-88-7	49
2,3-EPOXYBUTANE	3266-23-7	28
1,2-EPOXY-3-BUTENE	930-22-3	28

CHEMICAL	CAS NO.	PAGE
1,2-EPOXYDECANE	2404-44-6	28
2,3-EPOXY-1,4-DICHLOROBUTANE	3583-47-9	28
2,3-EPOXY-2,3-DIMETHYLBUTANE	5076-20-0	28
1,2-EPOXYDODECANE	2855-19-8	28
1,2-EPOXY-3-FLUOROPROPANE	503-09-3	28
1,2-EPOXYHEXADECANE	7320-37-8	37
1,2-EPOXYHEXADECANE	7320-37-8	44
1,2-EPOXYHEXADECANE	7320-37-8	49
1,2-EPOXY-1,1,2,3,3,3-HEXAFLUOROPROPANE	428-59-1	28
3,4-EPOXYNITROSOPIPERIDINE		2
1,2-EPOXYOCTADECANE	7390-81-0	28
9,10-EPOXYOCTADECANOIC ACID, 2-ETHYLHEXYL ESTER	141-38-8	28
1,2-EPOXYTETRADECANE	3234-28-4	28
1,2-EPOXY-3,3,3-TRICHLOROPROPANE	3083-23-6	37
ERYTHROMYCIN STEARATE	643-22-1	37
ERYTHROMYCIN STEARATE	643-22-1	44
ERYTHROMYCIN STEARATE	643-22-1	49
ERYTHROSIN B	16423-68-0	94
ESTRADIOL	50-28-2	58
ESTRADIOL	50-28-2	58
ESTRADIOL	50-28-2	58
ESTRADIOL	50-28-2	58
ESTRADIOL	50-28-2	58
ETHACRYNIC ACID	58-54-8	101
ETHANOL	64-17-5	74
ETHANOL	64-17-5	78
ETHANOL	64-17-5	113
ETHANOLAMINE	141-43-5	67
ETHINYLESTRADIOL	57-63-6	28
ETHIONAMIDE	536-33-4	28
ETHIONINE	13073-35-3	89
ETHOSUXIMIDE	77-67-8	94
2-ETHOXYETHANOL (EGMEE)	110-80-5	49
N-(3-ETHOXYPHENYL)ACETAMIDE	591-33-3	28
3-ETHOXY-1-PROPANOL	111-35-3	67
ETHYL ACETATE	141-78-6	28
3-ETHYLADENINE	43003-87-8	58
7-ETHYLADENINE	24309-36-2	58
ETHYLAZOXYETHANE		2
ETHYLAZOXYMETHANE		2
ETHYLBENZENE	100-41-4	67
ETHYL BROMIDE	74-96-4	37
ETHYL BROMIDE	74-96-4	44
ETHYL CHLORIDE	75-00-3	28
ETHYL CHLORIDE	75-00-3	44
S-(ETHYL)CHLOROTHIOFORMIC ACID	2941-64-2	28
O2-ETHYLCYTOSINE		58
1-ETHYLDEOXYADENOSINE		58

CHEMICAL INDEX

CHEMICAL	CAS NO.	PAGE
N6-ETHYLDEOXYADENOSINE		58
3-ETHYLDEOXYCYTIDINE		58
N4-ETHYLDEOXYCYTIDINE		58
1-ETHYLDEOXYGUANOSINE		58
N2-ETHYLDEOXYGUANOSINE		58
O6-ETHYLDEOXYGUANOSINE		58
1-ETHYL-4-(DIETHYLDIAMINE)PIPERAZINE	EMTDP-59	28
N-ETHYL-N,N-DIPHENYLUREA	18168-01-9	28
S-ETHYL DIPROPYLTHIOCARBAMATE	759-94-4	28
ETHYLENEDIAMINE TETRAACETIC ACID (EDTA)	150-38-9	37
ETHYLENEDIAMINE TETRAACETIC ACID (EDTA)	150-38-9	49
ETHYLENE DIBROMIDE	106-93-4	89
ETHYLENE GLYCOL	107-21-1	37
ETHYLENE GLYCOL	107-21-1	44
ETHYLENE GLYCOL MONOETHYL ETHER	110-80-5	44
ETHYLENE OXIDE	75-21-8	28
ETHYLENE OXIDE	75-21-8	37
ETHYLENE OXIDE	75-21-8	44
N-ETHYLENE-TETRAETHYLPENTAMINE	ENTDP-57	28
ETHYLENE THIOUREA	96-45-7	40
ETHYLENE THIOUREA	96-45-7	44
ETHYLENE THIOUREA	96-45-7	49
3-ETHYLGUANINE	55146-01-5	58
7-ETHYLGUANINE	19530-88-2	58
2-ETHYLHEXANAL	123-05-7	28
2-ETHYLHEXANOIC ACID	149-57-5	37
2-ETHYLHEXANOL	104-76-7	37
2-ETHYLHEXENAL	26266-68-2	28
2-ETHYL-2-HEXENAL	645-62-5	28
2-ETHYLHEXYLAMINE	104-75-6	28
2-ETHYLHEXYL GLYCIDYL ETHER	2461-15-6	28
3-((ETHYLHEXYL)OXY)PROPIONITRILE	10213-75-9	28
3-((ETHYLHEXYL)OXY)PROPYLAMINE	5397-31-9	28
ETHYLHYDROXY HEXANOIC ACID	29671-57-6	28
ETHYL METHANESULFONATE	65-50-0	58
ETHYL METHANESULFONATE	62-50-0	58
ETHYL METHANESULFONATE	62-50-0	58
N-ETHYL-4-NITROANILINE	3665-80-3	28
ETHYLNITROSOUREA	759-73-9	21
ETHYLNITROSOUREA	759-73-9	58
ETHYLNITROSOUREA	759-73-9	118
4-ETHYLSULFONYLNAPHTHALENE-1-SULFONAMIDE	842-00-2	58
ETHYLTHMIDYL(3'-5')DEOXYADENOSINE		59
3-ETHYLTHYMIDINE	21473-40-5	58
O2-ETHYLTHYMIDINE	59495-21-5	59
O4-ETHYLTHYMIDINE		59
ETHYLTHYMIDYL(3'-5')DEOXYCYTIDINE		59
N-ETHYL-O-TOLUENESULFONAMIDE	1077-56-1	28

CHEMICAL	CAS NO.	PAGE
EUGENOL	97-53-0	40
EXTRACTS FROM WORKPLACE SAMPLES		67
TRANS FATTY ACIDS		51
FD AND C RED NO. 32	3118-97-6	28
FD AND C RED NO. 40	25956-17-6	51
FD AND C YELLOW NO. 5	1934-21-0	51
FD AND C YELLOW NO. 6	2783-94-0	28
FENDILINE	13042-18-7	28
FERRIC AMMONIUM FERROCYANIDE	25869-00-5	29
FERRIC AMMONIUM FERROCYANIDE	25869-00-5	37
FERRIC CHLORIDE	7705-08-0	49
FERROCENE	102-54-5	14
FIAC		93
FIAC		93
FIAC		93
FIAC		93
FLUOMETURON	2164-17-2	49
FLUORENES		90
8-(N-FLUOREN-2-YLACETAMIDO)-2'-DEOXYGUANOSINE 5'-MONO PHOSPHATE	14490-86-9	59
8-(N-FLUOREN-2-YLAMINO)-2'DEOXYGUANOSINE 5'-MONO PHOSPHATE	17660-46-7	59
FLUORESCEINS		94
FLUORIDE	16984-48-8	113
6-FLUOROBENZO(A)PYRENE		90
5-FLUORO-2'-DEOXYURIDINE (FUdR)		110
5-FLUOROURACIL	51-21-8	110
5-FLUOROURACIL	51-21-8	110
5-FLUOROURACIL (5-FU)	51-21-8	110
7-FLUROBENZANTHRACENE-TRANS-5,6-DIHYDRODIOL		59
FLY ASH ASSOCIATED HYDROCARBONS		118
FORMALDEHYDE	50-00-0	67
FORMALDEHYDE	50-00-0	97
FORMALDEHYDE	50-00-0	113
FORMANILIDE	103-70-8	29
12-FORMYLBENZ(A)ANTHRACENE	3558-03-0	59
5-FORMYLBENZ(A)ANTHRACENE		59
6-FORMYLBENZ(A)ANTHRACENE		59
7-FORMYLBENZ(A)ANTHRACENE	7505-62-6	59
8-FORMYLBENZ(A)ANTHRACENE	72533-46-1	59
N-FORMYL-N-HYDROXY-2-AMINOFLUOENE	67176-33-4	59
FOUNDRY EFFLUENTS		67
FOUNDRY PARTICULATES		67
FURAN	110-00-9	40
FURAN	110-00-9	37
FURAN	110-00-9	44
FURAN	110-00-9	49
FURAZOLIDONE		87

CHEMICAL INDEX

CHEMICAL	CAS NO.	PAGE
FURFURAL	98-01-1	44
FURFURAL	98-01-1	67
FUROSEMIDE	54-31-9	44
FUROSEMIDE	54-31-9	49
FUROSEMIDE	54-31-9	87
FUROSEMIDE	54-31-9	87
GENTAMICIN	1403-66-3	90
GENTAMICIN	1403-66-3	90
GENTAMICIN	1403-66-3	90
GENTAMICIN	1403-66-3	97
GENTAMICIN	1403-66-3	110
GENTAMYCIN	1403-66-3	110
GENTIAN VIOLET	548-62-9	53
GENTIAN VIOLET	548-62-9	59
GENTIAN VIOLET	548-62-9	59
GENTIAN VIOLET	548-62-9	59
GEPHYROTOXIN	55893-12-4	101
GLIOTOXINS		101
GLUCOCORTICOIDS		113
GLUCOCORTOIDS		98
GLUTARALDEHYDE	111-30-8	44
GLUTARALDEHYDE	111-30-8	51
GLUTARALDEHYDE	111-30-8	67
GLUTATHIONE, OXIDIZED	27025-41-8	14
GLUTATHIONE, OXIDIZED	27025-41-8	16
GLUTATHIONE, REDUCED	70-18-8	14
GLUTATHIONE, REDUCED	70-18-8	16
GLYCENE ESTER OF APHIDICOLIN		19
GLYCIDOL	556-52-5	40
GLYCIDOL	556-52-5	44
GLYCIDYL ACRYLATE	106-90-1	29
GLYCIDYL METHACRYLATE	106-91-2	29
GLYCOL(POLYSORBATE 80)	9005-65-6	44
GOLD		90
GOLD SODIUM THIOMALATE	39377-38-3	65
GOLDTHIOMALATE	39377-38-3	65
GONADATROPIC RELEASING HORMONE ANALOGS		70
GONADOTROPIC RELEASING HORMONE		70
GONADOTROPIC RELEASING HORMONE ANALOGS		70
GONADOTROPIC RELEASING HORMONE ANALOGS		70
GONADOTROPIC RELEASING HORMONE ANALOGS		70
GONADOTROPIC RELEASING HORMONE (38 ANALOGS)		70
GONYAUTOXINS	35554-08-6	101
GRAYANOTOXIN	1399-60-6	101
GRISEOFULVIN	126-07-8	101
GRISEOFULVIN	126-07-8	29
N-(GUANOSINE-8-YL)-4-AMINOBIPHENYL		59
GUAR GUM	9000-30-0	51

CHEMICAL	CAS NO.	PAGE
GUM ARABIC	9000-01-5	51
GUM ARABIC	9000-01-5	51
GUM TRAGACANTH		52
HADACIDIN	689-13-4	94
HALOACETONITRILES		120
HALOALKYLAMINES		95
HALO ALKYL PHOSPHATES		20
HALOAROMATIC COMPOUNDS		94
HALOBENZENES		101
HALOCARBONS		87
HALOGENATED ACETONITRILES		120
HALOGENATED DIBENZOFURANS		21
HALOGENATED ETHANES		120
HALOGENS HALOHYDROCARBONS		87
HALOPERIDOL	52-86-8	106
HALOTHANE	151-67-7	87
HALOTHANE	151-67-7	90
HALOTHANE	151-67-7	101
HALOTHANE	151-67-7	101
HAZARDOUS AIR POLLUTANTS		120
HC BLUE 2	33229-34-4	49
HC-BLUE-NO. 1	2784-94-3	59
HC RED 3	2871-01-4	44
HC YELLOW 4	52551-67-4	44
HC YELLOW 4	52551-67-4	38
HEAT STABLE TOXIN OF E. COLI		52
HEAVY METALS		20
HEAVY METALS		20
HEAVY METALS		20
HEAVY METALS		94
HEAVY METALS		97
HEAVY METALS		100
HEAVY METALS		101
HEAVY METALS		101
HEAVY METALS		102
HEAVY METALS ON PARTICLES		118
HEMATOPORPHYRIN		110
HEPARIN		85
HEPARIN	9005-49-6	75
HEPARIN-DERIVED ANTICOAGULANTS		85
HEPTACHLOR	76-44-8	49
HEPTADECYLHYDROXYETHYLIMIDAZOLINE	95-19-2	16
HEPTADECYLHYDROXYETHYLIMIDAZOLINE	95-19-2	15
HEXABROMONAPHTHALENE		21
1,2,3,4,6,7-HEXABROMONAPHTHALENE	75625-24-0	29
HEXACHLOROBENZENE	118-74-1	38
HEXACHLORO-1,3-BUTADIENE		22
HEXACHLORO-1,3-BUTADIENE	87-68-3	44

CHEMICAL INDEX

CHEMICAL	CAS NO.	PAGE
HEXACHLOROCYCLOPENTADIENE	77-47-4	38
HEXACHLOROCYCLOPENTADIENE	77-47-4	44
1,2,3,6,7,8-HEXACHLORODIBENZO-P-DIOXIN	57653-85-7	29
HEXACHLOROETHANE	67-72-1	44
HEXACHLOROETHANE	67-72-1	49
HEXACHLORONAPHTHALENE	1335-87-1	29
HEXACHLOROPHENE	70-30-4	101
1,1,1,3,3,3-HEXAFLUORO-2PROPANOL	920-66-1	29
HEXAMETHYL-P-ROSANILINE CHLORIDE	548-62-9	40
HEXANE	110-54-3	74
1,6-HEXANEDIAMINE	124-09-4	44
1,3,6-HEXANETRICARBONITRILE	1772-25-4	29
HEXYL GLYCIDYL ETHER	5926-90-9	29
HEXYLRESORCINOL	136-77-6	44
HISTAMINE	51-45-6	101
HISTAMINE	51-45-6	111
HUMIC ACID	1415-93-6	120
HYCANTHONE METHANESULFONATE	23255-93-8	29
HYDANTOINS		81
HYDANTOINS		102
HYDRALAZINE	86-54-4	65
HYDRALAZINE	86-54-4	65
HYDROCARBON		101
HYDROCHLORIC ACID	7647-01-0	81
HYDROCHLOROTHIAZIDE	58-93-5	9
HYDROCHLOROTHIAZIDE	58-93-5	9
HYDROCHLOROTHIAZIDE	58-93-5	44
HYDROCYANIC ACID	74-90-8	29
HYDROGEN PEROXIDE	7722-84-1	111
HYDROGEN PEROXIDE	7722-84-1	111
HYDROGEN PEROXIDE	7722-84-1	111
HYDROGEN PEROXIDE	7722-84-1	113
HYDROQUINONE	123-31-9	40
HYDROQUINONE	123-31-9	44
HYDROTREATED COAL LIQUEFACTION PRODUCTS		118
N-HYDROXYACETAMINOPHEN	63975-21-3	59
4-HYDROXYACETANILIDE	103-90-2	45
3-HYDROXYACETANILIDE	621-42-1	90
N-HYDROXY-2-ACETYLAMINOFLUORENE	53-95-2	59
N-HYDROXY-2-ACETYLAMINOFLUORENE	53-95-2	59
N-HYDROXY-N-ACETYL-2-AMINOFLUORENE	30651-40-2	59
N-HYDROXY-N-ACETYL-2-AMINOFLUORENE		59
N-HYDROXY-1-ACETYLAMINOPYRENE		59
N'-HYDROXY-N-ACETYLBENZIDINE	71609-23-9	60
N-HYDROXY-N-ACETYLBENZIDINE	71609-25-1	60
N-HYDROXY-4-AMINOBIPHENYL	6810-26-0	60
N-HYDROXY-AMINOFLUORENE	53-94-1	60
N-HYDROXY-AMINOFLUORENE	53-94-1	60

CHEMICAL	CAS NO.	PAGE
N-HYDROXY-2-AMINOFLUORENE	53-94-1	60
N-HYDROXY-1-AMINOPYRENE		60
6-HYDROXYDOPAMINE	1199-18-4	101
L-HYDROXYDOPAMINE		103
N-(HYDROXYETHYL)ETHYLENEDIAMINE	111-41-1	40
N-HYDROXY-N-FORMYL-2-AMINOFLUORENE		60
HYDROXYLAMINE, HYDROCHLORIDE	5470-11-1	29
HYDROXYL RADICAL		111
HYDROXYL RADICAL		111
2-HYDROXY-4-METHOXYBENZOPHENONE	131-57-7	45
2-HYDROXY-4-METHOXYBENZOPHENONE	131-57-7	45
12-HYDROXYMETHYLBENZ(A)ANTHRACENE	13345-63-6	60
1-HYDROXYMETHYLBENZ(A)ANTHRACENE		60
7-HYDROXYMETHYLBENZ(A)ANTHRACENE	16110-13-7	60
6-HYDROXYMETHYLBENZ(A)PYRENE	21247-98-3	60
2-HYDROXY-1,4-NAPHTHOQUINONE	83-72-7	40
(3H)-N-HYDROXY-1-NAPHTHYLAMINE		60
(3H)N-HYDROXY-2-NAPHTHYLAMINE		60
N-HYDROXY-1-NAPHTHYLAMINE	607-30-7	60
N-HYDROXY-1-NAPHTHYLAMINE	607-30-7	60
N-HYDROXY-2-NAPHTHYLAMINE	613-47-8	60
N-HYDROXY-2-NAPHTHYLAMINE	613-47-8	60
N-HYDROXY-2-NAPHTHYLAMINE	613-47-8	60
N-HYDROXYPHENACETIN	19315-64-1	60
N-HYDROXY-P-PHENETIDINE	19315-64-1	60
CIS-HYDROXYPROLINE		111
N-HYDROXY-N-PROPIONYL-2AMINOFLUORENE		60
8-HYDROXYQUINOLINE SULFATE	134-31-6	29
5-HYDROXYTRYPTOPHAN	56-69-9	107
5-HYDROXYTRYPTOPHANE	56-69-9	107
IDURD		93
IMIDAZOLES		82
IMIDAZOLIDINES		82
IMIPRAMINE	50-49-7	82
INDOMETHACIN	53-86-1	106
INDOMETHECIN	53-86-1	111
INNAMALDEHYDE	104-55-2	56
INORGANIC DRINKING WATER CONTAMINANTS		120
INSECTICIDES		117
INTERFERON	9008-11-1	94
INTERFERON	9008-11-1	95
INTERFERON	9008-11-1	111
IN VITRO NEUROTOXICITY		94
IODACETIC ACID	64-69-7	29
IODINATED GLYCEROL	5634-39-9	45
5-IODO-5'-AMINO-2',5'DIDEOXYCYTIDINE (AIC)		111
5-IODO-5'-AMINO-2',5'DIDEOXYURIDINE (AIU)		111
IODOCHLOROHYDROXYQUINOLINE	130-26-7	29

CHEMICAL INDEX

CHEMICAL	CAS NO.	PAGE
5'-IODO-2'-DEOXYURIDINE (DOXURIDINE)	54-42-2	111
IONOPHORE (A23187)	52665-69-7	52
IRON	7439-89-6	90
IRON DEXTRAN	9004-66-4	49
ISATIN-5-SULFONIC ACID SODIUM SALT	80789-74-8	40
ISOAMYL NITRITE	110-46-3	15
ISOBUTYL ALCOHOL	78-83-1	29
ISOBUTYL NITRITE	542-56-3	15
ISOBUTYL NITRITE	542-56-3	45
ISOBUTYRALDEHYDE	78-84-2	49
ISOBUTYRALDEHYDE	78-84-2	45
ISODECYL METHACRYLATE	29964-84-9	29
ISOEUGENOL	97-54-1	15
ISOEUGENOL	97-54-1	16
ISONIAZID	54-85-3	90
ISOPHORONE	78-59-1	45
ISOPHTHALIC DIGLYCIDYL ESTER	67846-32-6	29
ISOPRENE	78-79-5	38
ISOPRENE	78-79-5	40
ISOPRENE	78-79-5	45
P-ISOPROPOXYDIPHENYLAMINE	101-73-5	29
2-ISOPROPOXYPHENYL-N-METHYLCARBAMATE	114-26-1	15
2-ISOPROPOXYPHENYL-N-METHYLCARBAMATE	114-26-1	16
ISOPROPYL ALCOHOL	67-63-0	67
ISOPROPYLAMINE	75-31-0	78
N-ISOPROPYLANILINE	768-52-5	29
ISOPROPYL GLYCIDYL ETHER	4016-14-2	40
ISOPROPYL METHYLPHOSPHOROFLUORIDATE		60
ISOPROTERENOL	7683-59-2	65
ISOPROTERENOL	7683-59-2	65
ISOPROTERENOL	7683-59-2	94
ISOQUINOLINES AND RELATED ANALOGS		93
KAINATE		111
KAINIC ACID	487-79-6	95
KAINIC ACID	487-79-6	95
KAINIC ACID	487-79-6	101
KANAMYCIN	59-01-8	97
KANAMYCIN	59-01-8	111
KAOLIN	1332-58-7	82
KAOLIN	1332-58-7	82
KEPONE	143-50-0	21
LANTHANUM NITRATE HEXAHYDRATE	10277-43-7	29
LAPACHOL	84-79-7	16
LASALOCIDS	11054-70-9	101
LASIOCARPINE	303-34-4	38
LAURIC ACID	143-07-7	29
LAURIC ACID DIETHANOLAMINE	120-40-1	45
LAURIC ACID DIETHANOLAMINE CONDENSATE	120-40-1	49

CHEMICAL	CAS NO.	PAGE
LAURYL GLYCIDYL ETHER	2461-18-9	29
LEAD	7439-92-1	74
LEAD	7439-92-1	74
LEAD	7439-92-1	74
LEAD	7439-92-1	95
LEAD	7439-92-1	101
LEAD		120
LEAD	7439-92-1	120
LEAD NAPHTHENATE	61790-14-5	15
LEAD OXIDE	1317-36-8	67
LEAD SULFIDE	1317-87-0	67
LEVCO VAT BLUE 1	6537-68-4	29
LEVODOPA	59-92-7	90
LEVONORGESTREL		72
LEVONORGETREL		72
LIDOCAINE	137-58-6	78
LIDOCAINE	137-58-6	102
D-LIMONENE	5989-27-5	38
D-LIMONENE	5989-27-5	45
D-LIMONENE	5989-27-5	49
LINDANE	58-89-9	60
LINDANE	58-89-9	60
LINDANE	58-89-9	60
LINDANE	58-89-9	60
LIPID EPOXIDES		20
LIPID SOLUBLE DRUGS		102
LITHIUM	7439-93-2	115
LITHIUM		70
LITHIUM	7439-93-2	115
LITHOCHOLIC ACID	434-13-9	29
LOCAL ANESTHETICS		102
LUMINOL	521-31-3	29
LYMPHOKINES		82
MACROLIDE ANTIBIOTICS		82
MAGNESIUM	7439-95-4	102
MAGNESIUM	7439-95-4	105
MAGNESIUM PEMOLINE	18968-99-5	102
MALAOXON	1634-78-2	29
MALATHION	121-75-5	49
MALONALDEHYDE	542-78-9	67
MALONALDEHYDE	542-78-9	45
MALONALDEHYDE, SODIUM SALT	24382-04-5	38
MALTOL	118-71-8	40
MANGANESE	7439-96-5	95
MANGANESE	7439-96-5	52
MANGANESE NAPHTHENATE	1336-93-2	15
MANNITOL		52
D-MANNITOL	69-65-8	49

CHEMICAL INDEX

CHEMICAL	CAS NO.	PAGE
MECLOFENAMIC ACID		111
MELAMINE	108-78-1	49
ALPHA-MELANOCYTE STIMULATING HORMONE	9002-79-3	70
DL-MENTHOL	15356-70-4	29
2-MERCAPTOBENZIMIDAZOLE	583-39-1	38
2-MERCAPTOBENZIMIDAZOLE	583-39-1	45
2-MERCAPTOBENZIMIDAZOLE	583-39-1	49
MERCAPTOBENZOTHIAZOLE	149-30-4	49
2-MERCAPTOBENZOTHIAZOLE	149-30-4	45
2-MERCAPTO-4-METHYL-5THIAZOLYL METHYL KETONE	7725-93-1	29
6-MERCAPTOPURINE	6112-76-1	65
6-MERCAPTOPURINE	6112-76-1	65
6-MERCAPTOPURINE	50-44-2	100
MERCURIC CHLORIDE	7487-94-7	40
MERCURIC CHLORIDE	7487-94-7	45
MERCURIC CHLORIDE	7487-94-7	49
MERCURIC CHLORIDE	7487-94-7	65
MERCURIC CHLORIDE	7487-94-7	65
MERCURIC CHLORIDE	7487-94-7	90
MERCURY	7439-97-6	74
MERCURY	7439-97-6	74
MERCURY	7439-97-6	113
MERCURY	7439-97-6	113
METALS		102
METALS, TRACE		21
METHACRYLONITRILE	126-98-7	40
METHADONE	76-99-3	66
METHAFURYLENE	531-06-6	9
METHAPHENILENE	493-78-9	9
METHAPYRILENE	91-80-5	9
METHAPYRILENE	91-80-5	9
METHAPYRILENE	91-80-5	60
METHAPYRILENE HYDROCHLORIDE	135-23-9	8
METHAPYRILENE HYDROCHLORIDE	135-23-9	17
METHAPYRILENE HYDROCHLORIDE	135-23-9	49
METHDILAZINE	1982-37-2	45
4-(METHODYBENZILIDINE-4'BUTYLANILINE (MBBA)	26227-73-6	29
METHOTREXATE	59-05-2	95
METHOTREXATE	59-05-2	111
METHOTREXATE	59-05-2	111
METHOTREXATE	59-05-2	113
METHOTREXATE GAMMA ASPARTATE		111
2-(P-METHOXYBENZYLAMINO)-PYRIDINE		60
3-((METHOXYCARBONYL)AMINO)PHENYL N-(3-METHYLPHENYL) CARBAMATE	13684-63-4	29
2-METHOXY-DMBA		12
3-METHOXY-DMBA	66240-02-6	12
4-METHOXY-DMBA	16277-49-9	12
2-METHOXYETHANOL	109-86-4	68
METHOXYETHYL MERCURY CHLORIDE	123-88-6	30
METHOXYFLURANE	76-38-0	30
5-METHOXYPSORALEN	484-20-8	52
8-METHOXYPSORALEN	298-81-7	45
8-METHOXYPSORALEN	298-81-7	52
8-METHOXYPSORALEN	298-81-7	52
3-METHYLADENINE	5142-23-4	60
7-METHYLADENINE	935-69-3	61
N-METHYL-4-AMINOAZOBENZENE	621-90-9	61
3-METHYLAMINO-4-METHYLPHENOL	6265-13-0	30
N-METHYLANILINE	100-61-8	61
METHYLAZOXYETHANE		2
METHYLAZOXYMETHANE		2
METHYLAZOXYMETHANE-D3		2
1-METHYLBENZ(A)ANTHRACENE	2498-77-3	61
1-METHYLBENZ(A)ANTHRACENE	2498-77-3	61
1-METHYLBENZ(A)ANTHRACENE	2498-77-3	61
2-METHYLBENZ(A)ANTHRACENE	2498-76-2	61
3-METHYLBENZ(A)ANTHRACENE	2498-75-1	61
4-METHYLBENZ(A)ANTHRACENE	316-49-4	61
5-METHYLBENZ(A)ANTHRACENE	2319-96-2	61
6-METHYLBENZ(A)ANTHRACENE	316-14-3	61
7-METHYLBENZ(A)ANTHRACENE	2541-69-7	61
8-METHYLBENZ(A)ANTHRACENE	2381-31-9	61
9-METHYLBENZ(A)ANTHRACENE	2381-16-0	61
10-METHYLBENZ(A)ANTHRACENE	2381-15-9	61
11-METHYLBENZ(A)ANTHRACENE	6111-78-0	61
12-METHYLBENZ(A)ANTHRACENE	2422-79-9	61
12-METHYLBENZ(A)ANTHRACENE-TRANS-DIHYDRODIOL		61
7-METHYLBENZ(A)ANTHRACENE-TRANS-5,6-DIHYDRODIOL		61
METHYLBENZENE	108-88-3	120
METHYL-2 BENZIMIDAZOLE CARBAMATE	METHYL-28	30
6-METHYLBENZO(A)PYRENE	2381-39-7	61
6-METHYLBENZO(A)PYRENE	2381-39-7	61
6-METHYLBENZO(A)PYRENE	2381-39-7	61
7-METHYLBENZO(A)PYRENE	63041-77-0	61
7-METHYLBENZO(A)PYRENE	63041-77-0	61
8-METHYLBENZO(A)PYRENE	63041-76-9	61
8-METHYLBENZO(A)PYRENE	63041-76-9	61
10-METHYLBENZO(A)PYRENE	63104-32-5	61
10-METHYLBENZO(A)PYRENE	63104-32-5	61
10-METHYLBENZO(A)PYRENE	63104-32-5	61
7-METHYLBENZO(A)PYRENE-TRANS-7-,8-DIHYDRODIOL		61
7-METHYLBENZO(A)PYRENE-TRANS-7-,8-DIHYDRODIOL-ANTI-9,10-EPOXIDE		61
4-(6-METHYL-2-BENZOTHIAZOYL)BENZENAMINE	92-36-4	30
7-METHYLBENZ(A)PYRENE	63041-77-0	62

274<

CHEMICAL INDEX

CHEMICAL	CAS NO.	PAGE
ALPHA-METHYLBENZYL ALCOHOL	98-85-1	45
ALPHA-METHYLBENZYL ALCOHOL	98-85-1	49
ALPHA-METHYLBENZYL ALCOHOL	98-85-1	38
METHYL BROMIDE	74-83-9	22
METHYL BROMIDE	74-83-9	30
METHYL BROMIDE	74-83-9	45
METHYL CARBAMATE	598-55-0	21
METHYL CARBAMATE	598-55-0	40
METHYL CARBAMATE	598-55-0	45
METHYL CARBAMATE	598-55-0	49
METHYLCHOLANTHRENE	56-49-5	90
O2-METHYLCYTOSINE		62
METHYL DEMETON	8022-00-2	30
METHYL DEMETON	8022-00-2	102
1-METHYLDEOXYADENOSINE		62
N6-METHYLDEOXYADENOSINE		62
3-METHYLDEOXYCYTIDINE		62
N4-METHYLDEOXYCYTIDINE		62
1-METHYLDEOXYGUANOSINE		62
O6-METHYLDEOXYGUANOSINE		62
N'-METHYL-N,N-DIPHENYLUREA	13114-72-2	30
METHYLDOPA	555-30-6	21
METHYLDOPA	555-30-6	38
METHYLDOPA	555-30-6	45
METHYLDOPA	555-30-6	49
METHYLDOPA	555-30-6	66
METHYLDOPA	555-30-6	66
METHYLENEBIS(4-CYCLOHEXYL ISOCYANATE)	5124-30-1	30
2,2'-METHYLENE BIS(PHENYLENEOXYMETHYLENE)BISOXIRANE	39817-09-9	30
METHYLENE BIS(THIOCYANATE)	6317-18-6	30
METHYLENE CHLORIDE	75-09-2	45
METHYLENEDIANILINE	101-77-9	30
METHYLETHYL KETONE	78-93-3	30
METHYL ETHYL KETONE	78-93-3	68
METHYL FLUOROSULFONATE	421-20-5	15
METHYLGLUTARONITRILE	4553-62-2	30
METHYL GLYCIDYL ETHER	930-37-0	30
3-METHYLGUANINE	2958-98-7	62
3-METHYLGUANINE	2958-98-7	62
7-METHYLGUANINE	578-76-7	62
METHYL ISOBUTYL KETONE	108-10-1	68
METHYL MERCURIC CHLORIDE	115-09-3	30
METHYL MERCURIC CHLORIDE	115-09-3	62
METHYL MERCURY	22967-92-6	52
METHYL MERCURY	22967-92-6	62
METHYL MERCURY	22967-92-6	62
METHYL MERCURY	22967-92-6	101
METHYL MERCURY HYDROXIDE	1184-57-2	30

CHEMICAL	CAS NO.	PAGE
METHYL METHACRYLATE	80-62-6	45
METHYL METHANESULFONATE	66-27-3	62
METHYL METHANESULFONATE	66-27-3	62
METHYL METHANESULFONATE	66-27-3	62
2-METHYL-3-NITROANILINE	603-83-8	30
2-METHYL-4-NITROANILINE	99-52-5	30
2-METHYL-6-NITROANILINE	570-24-1	30
4-METHYL-2-NITROANILINE	89-62-3	30
4-METHYL-3-NITROANILINE	119-32-4	30
5-METHYL-2-NITROANILINE	578-46-1	30
N-METHYL-4-NITROANILINE	100-15-2	30
2-METHYL-3-NITRO-BENZOIC ACID	1975-50-4	30
2-METHYL-5-NITRO-BENZOIC ACID	1975-52-6	30
2-METHYL-6-NITRO BENZOIC ACID	13506-76-8	30
3-METHYL-2-NITRO-BENZOIC ACID	5437-38-7	30
3-METHYL-4-NITRO-BENZOIC ACID	3113-71-1	30
4-METHYL-3-NITRO-BENZOIC ACID	96-98-0	30
5-METHYL-2-NITRO-BENZOIC ACID	3113-72-2	30
2-METHYLNITROSOMORPHOLINE	75881-16-2	2
2-METHYLNITROSO-1,3-OXAZOLIDINE	39884-53-2	2
5-METHYLNITROSO-1,3-OXAZOLIDINE	35631-27-7	2
3-METHYLNITROSO-4-PIPERIDONE		3
N-METHYL-N-NITROSOUREA	684-93-5	62
N-METHYLOLACRYLAMIDE	924-42-5	45
METHYLPHENIDATE	113-45-1	102
METHYLPHENIDATE HCl	298-59-9	45
METHYL PREDNISOLONE	83-43-2	106
METHYLPREDNISOLONE	83-43-2	102
N-METHYLSULFAMETHAZINE		62
3-METHYLTHYMIDINE	958-74-7	62
O2-METHYLTHYMIDINE		62
O4-METHYLTHYMIDINE		62
METHYLTHYMIDYLYL(3'-5')DEOXYADENOSINE		62
METHYLTHYMIDYLYL(3'-5')DEOXYCYTIDINE		62
METHYLTHYMIDYLYL(3'-5')THYMIDINE		62
METHYLTIN-TRIS(ISOOCTYLMERCAPTOACETATE)	54849-38-6	30
METHYL TRIFLUOROMETHANESULFONATE	333-27-7	30
METHYL VIOLOGEN	1910-42-5	49
METHYL XANTHINES		52
METKEPHAMID		71
METRAZOLE	54-95-5	102
METRONIDAZOLE	443-48-1	30
MEXACARBATE	315-18-4	30
MICHLER'S KETONE	90-94-8	30
MINOXIDIL	38304-91-5	66
MIREX	2385-85-5	45
MNNG/TPA/BPO (N-METHYL-N'NITRO-N-NITR	70-25-7	45
MOLYBDENUM TRIOXIDE	1313-27-5	45

CHEMICAL INDEX

CHEMICAL	CAS NO.	PAGE
MOLYBDENUM TRIOXIDE	1313-27-5	31
MOLYBDENUM TRIOXIDE	1313-27-5	49
MONOCHLOROACETIC ACID	79-11-8	40
MONOCHLOROACETIC ACID	79-11-8	45
MONOCROTALINE		82
MONOETHYLAMINE	75-04-7	78
MONO(2-ETHYLHEXYL)ADIPATE	4337-65-9	49
MONOISOPROPANOLAMINE	78-96-6	40
MONOSODIUM GLUTAMATE	142-47-2	31
MONURON	150-68-5	9
MORPHINE	57-27-2	102
MORPHOLINE		11
MORPHOLINE		11
MORPHOLINE	110-91-8	11
MORPHOLINE HYDROCHLORIDE	10024-89-2	11
MORPHOLINE HYDROCHLORIDE	10024-89-2	11
MORPHOLINE HYDROCHLORIDE	10024-89-2	11
MORPHOLINE HYDROCHLORIDE	10024-89-2	11
MORPHOLINE HYDROCHLORIDE	10024-89-2	11
MORPHOLINE NITROSOPROLINE SALT		11
MORPHOLINE NITROSOPROLINE SALT		11
MOUNT ST. HELENS DUST		82
MOXESTROL	38416-55-2	62
MUTAGENIC AGENTS		71
MYCOTOXINS		99
MYCOTOXINS		100
MYCOTOXINS		105
MYCOTOXINS		100
NALIDIXIC ACID	389-08-2	38
NALIDIXIC ACID	389-08-2	45
NALOXONE	465-65-6	102
NAPHTHALENE	91-20-3	45
1,2-NAPTHALENEDIHYDRODIOL	7234-04-0	62
1-NAPHTHYLAMINE	134-32-7	62
2-NAPHTHYLAMINE	91-59-8	62
(3H)1-NAPHTHYLAMINE		62
(3H)2-NAPHTHYLAMINE		62
4-(2-NAPHTHYLAMINO)PHENOL	93-45-8	31
ALPHA-NAPHTHYL ISOTHIOCYANATE	551-06-4	31
2-NAPHTHYL LACTATE	93-43-6	31
NAVY FUELS JP-5		45
NEODECANOIC ACID, 2,3-EPOXYPROPYL ESTER	26761-45-5	31
NEOMYCIN	1404-04-2	95
NEOMYCIN	1404-04-2	97
NEOPENTYL GLYCOL DIGLYCIDYL ETHER	17557-23-2	31
NETILMICIN	56311-56-1	90
NEUROLEPTICS		115
NEUROLEPTICS		115

CHEMICAL	CAS NO.	PAGE
NEUROLEPTICS		115
NEUROLEPTICS		115
NEUROLEPTICS		115
NEUROLEPTICS		115
NEUROLEPTICS		115
NEUROLEPTICS		115
NEUROPHARMACOLGIC AGENTS		106
NEUROPHARMACOLOGICAL AGENTS		95
NEUROPHARMACOLOGICAL AGENTS		95
NEUROPHARMACOLOGICAL AGENTS		99
NEUROPHARMACOLOGICAL AGENTS		100
NEUROPHARMACOLOGICAL AGENTS		100
NEUROPHARMACOLOGICAL AGENTS		101
NEUROPHARMACOLOGICAL AGENTS		102
NEUROPHARMACOLOGICAL AGENTS		102
NEUROPHARMACOLOGICAL AGENTS		103
NEUROPHARMACOLOGICAL AGENTS		103
NEUROPHARMACOLOGICAL AGENTS		103
NEUROPHARMACOLOGICAL AGENTS		103
NEUROPHARMACOLOGICAL AGENTS		103
NEUROPHARMACOLOGICAL AGENTS		103
NEUROPHARMACOLOGICAL AGENTS		103
NEUROPHARMACOLOGICAL AGENTS		103
NEUROPHARMACOLOGICAL AGENTS		103
NEUROPHARMACOLOGICAL AGENTS		103
NEUROPHARMACOLOGICAL AGENTS		103
NEUROPHARMACOLOGICAL AGENTS		105
NEUROPHARMACOLOGICAL AGENTS		106
NEUROPHARMACOLOGICAL AGENTS		107
NEUROPHARMACOLOGICAL AGENTS		107
NEUROPHARMACOLOGICAL AGENTS		107
NEUROPHARMACOLOGICAL AGENTS		108
NEUROPHARMACOLOGICAL AGENTS (ANTICONVULSANTS)		99
NEUROPHARMACOLOGY		102
NEUROPSYCHOTIC DRUGS		74
NEUROTOXINS		95
NEUROTOXINS		95
NEUROTOXINS		95
NEUROTOXINS		97
NEUROTOXINS		97
NEUROTOXINS		97
NEUROTOXINS		97
NEUROTOXINS		97
NEUROTOXINS		100
NEUROTOXINS		101
NEUROTOXINS		101
NEUROTOXINS		102
NEUROTOXINS		102

CHEMICAL INDEX

CHEMICAL	CAS NO.	PAGE
NEUROTOXINS		102
NEUROTOXINS		102
NEUROTOXINS		103
NEUROTOXINS		103
NEUROTOXINS		103
NEUROTOXINS		103
NEUROTOXINS		103
NEUROTOXINS		103
NEUROTOXINS		104
NEUROTOXINS		104
NEUROTOXINS		104
NEUROTOXINS		104
NEUROTOXINS		104
NEUROTOXINS		104
NEUROTOXINS		104
NEUROTOXINS		104
NEUROTOXINS		104
NEUROTOXINS		104
NEUROTOXINS		104
NEUROTOXINS		104
NEUROTOXINS		104
NEUROTOXINS		104
NEUROTOXINS		104
NEUROTOXINS		104
NEUROTOXINS		104
NEUROTOXINS		105
NEUROTOXINS		105
NEUROTOXINS		105
NEUROTOXINS		105
NEUROTOXINS		105
NEUROTOXINS		105
NEUROTOXINS		107
NEUROTOXINS		107
NEUROTOXINS		108
NICKEL	7440-02-0	120
NICKEL CARBONYL	13463-39-3	31
NICKEL COMPOUNDS		118
NICKEL OXIDE	1313-99-1	45
NICKEL SUBSULFIDE	12035-77-3	45
NICKEL SULFATE HEXAHYDRATE	10101-97-0	45
NICKEL SULFATE HEXAHYDRATE	10101-97-0	49
NICOTINE	54-11-5	74
NICOTINE	54-11-5	76
NICOTINE	54-11-5	76
NIFEDIPINE	21829-25-4	31
NIFEDIPINE	21829-25-4	78
NITRILES		78
NITRITE	14797-65-0	9

CHEMICAL	CAS NO.	PAGE
NITRITE	14797-65-0	9
NITRITE	14797-65-0	9
NITRITE	14797-65-0	9
NITRITE	14797-65-0	9
NITRITE	14797-65-0	9
NITRITE	14797-65-0	9
NITRITE	14797-65-0	9
NITRITE	14797-65-0	9
NITRITE	14797-65-0	9
NITRITE	14797-65-0	9
NITRITE	14797-65-0	10
NITRITE	14797-65-0	10
NITRITE	14797-65-0	78
NITRITES		78
O-NITROANISOLE	91-23-6	45
9-NITROANTHRACENE	602-60-8	31
9-NITROANTHRACENE	602-60-8	38
4-NITROANTHRANILIC ACID	619-17-0	38
NITROARENES		20
4-NITRO-1,3-BENZENEDIAMINE	5131-58-8	31
O-NITROBENZOIC ACID	552-16-9	31
1-NITROBENZO(A)PYRENE	70021-99-7	62
6-NITROBENZO(A)PYRENE	63041-90-7	62
6-NITROBENZO(A)PYRENE	63041-90-7	62
6-NITROBENZO(A)PYRENE	63041-90-7	62
NITROBENZO(A)PYRENE		62
O-NITROBENZOYL CHLORIDE	610-14-0	31
P-NITROBENZOYL CHLORIDE	122-04-3	38
M-NITROBENZYL CHLORIDE	619-23-8	31
(3H)4-NITROBIPHENYL		62
4-NITROBIPHENYL	92-93-3	62
2-NITRO-1-BUTANOL	609-31-4	31
2-NITRODIPHENYLAMINE	119-75-5	31
2-NITROETHANOL	625-48-9	31
2-NITROFLUORENE	607-57-8	62
3-NITRO-9-FLUORENONE	42135-22-8	31
3-NITRO-9-FLUORENONE	42135-22-8	38
NITROFURANTOIN	67-20-9	46
NITROFURANTOIN	67-20-9	50
NITROFURANTOIN	67-20-9	66
NITROFURANTOIN	67-20-9	66
NITROFURANTOIN		82
NITROFURANTOIN	67-20-9	82
NITROFURANTOIN	67-20-9	82
NITROFURANTOIN	67-20-9	82
NITROFURAZONE	59-87-0	38
NITROFURAZONE	59-87-0	46
NITROGEN DIOXIDE	10102-44-0	82

CHEMICAL INDEX

CHEMICAL	CAS NO.	PAGE
NITROGEN DIOXIDE	10102-44-0	120
NITROGEN DIOXIDE	10102-44-0	120
NITROGEN DIOXIDE	10102-44-0	120
NITROGEN OXIDES		82
NITROGLYCERIN	55-63-0	105
1-NITRO-2-METHYLNAPHTHALENE	881-03-8	31
1-NITRONAPHTHALENE	86-57-7	62
O-NITROPHENETHYLALCOHOL, ACETATE	833-43-2	31
P-NITROPHENETHYLALCOHOL, ACETATE	104-30-3	31
P-NITROPHENOL	100-02-7	38
P-NITROPHENOL	100-02-7	46
P-NITROPHENOL	100-02-7	63
1-(4-NITROPHENYL)-2-CHLOROPROPANE	34197-98-3	31
2-NITRO-P-PHENYLENEDIAMINE	5307-14-2	31
4-NITRO-O-PHENYLENEDIAMINE	99-56-9	38
4-NITROPHENYLHYDROXYLAMINE	16169-16-7	63
4-NITROPHTHALIC ANHYDRIDE	5466-84-2	31
3-NITROPROPIONIC ACID	504-88-1	31
NITROPRUSSIDE	15078-28-1	78
NITROPRUSSIDE	13755-38-9	78
1-NITROPYRENE	5522-43-0	31
1-NITROPYRENE	5522-43-0	63
1-NITROPYRENE	5522-43-0	63
1-NITROPYRENE-CIS-4,5DIHYDRODIOL		63
1-NITROPYRENE-TRANS-4,5DIHYDRODIOL		63
(3H)-1-NITROPYRENE		63
NITROPYRENES		20
10-NITROPYRENOL		63
3-NITROPYRENOL		63
4-NITROPYRENOL		63
5-NITROPYRENOL		63
6-NITROPYRENOL		63
8-NITROPYRENOL		63
9-NITROPYRENOL		63
NITROSAMINE IN PACIFIERS: COMPLIANCE TESTING		63
NITROSAMINES IN PACIFIERS: COLLABORATION OF NCTR METHOD THROUGH AOAC		63
NITROSO-2-ACETOXYDIBENZYLAMINE		3
4'-NITROSO-N-ACETYL-4-AMINOBIPHENYL		63
NITROSO-4-ACETYL-3,5-DIMETHYLPIPERAZINE	75881-17-3	3
NITROSOALLYLETHANOLAMINE		3
NITROSOALLYLHYDROXYPROPYLAMINE		17
NITROSOALLYL-2-HYDROXYPROPYLAMINE		3
NITROSOALLYLOXOPROPYLAMINE		17
NITROSOALLYLUREA	760-56-5	12
NITROSO-N-AMYLUREA	10589-74-9	12
NITROSOAZETIDINE	15216-10-1	17
1-NITROSO-4-BENZOYL-3,5-DIMETHYLPIPERAZINE	61034-40-0	3

CHEMICAL	CAS NO.	PAGE
NITROSOBENZYLUREA	775-11-1	12
4-NITROSOBIPHENYL	10125-76-5	63
NITROSOBIS-(2-HYDROXYPROPYLAMINE		17
NITROSOBIS-(2-HYDROXYPROPYL)-A-MINE		3
NITROSO-BIS-(2-OXOPROPYL)-AMINE	60599-38-4	3
NITROSO-BIS-(2-OXOPROPYL)-AMINE	60599-38-4	17
NITROSO-N-BUTYLUREA	869-01-2	12
NITROSO-SEC-BUTYLUREA	71752-66-4	12
NITROSOCARBARYL	64158-97-0	12
NITROSOCHLOROETHYLDIETHYLUREA	69113-00-4	12
NITROSOCHLOROETHYLDIMETHYLUREA	59960-30-4	12
1-NITROSO-1-(2-CHLOROETHYL)-3-(2-HYDROXYETHYL)-UREA		3
1-NITROSO-1-(2-CHLOROETHYL)-3-(2-HYDROXYPROPYL)-UREA		3
NITROSOCIMETIDINE	73785-40-7	3
NITROSOCIMETIDINE	73785-40-7	12
NITROSOCYCLOHEXYLUREA	877-31-6	12
NITROSODI-N-BUTYLAMINE	924-16-3	3
NITROSODIETHANOLAMINE		17
NITROSODIETHANOLAMINE	1116-54-7	3
NITROSODIETHYLAMINE		17
N-NITROSODIETHYLAMINE	55-18-5	31
NITROSODIHYDROXYPROPYLALLYLAMINE		3
NITROSODIHYDROXYPROPYLALLYLAMINE		17
NITROSODIHYDROXYPROPYLETHANOLAMINE		3
NITROSODIHYDROXYPROPYLETHANOLAMINE		17
NITROSODIHYDROXYPROPYL-2-HYDRO-XYPROPYLAMINE		3
NITROSODIHYDROXYPROPYLOXOPROPYLAMINE		17
NITROSODIHYDROXYPROPYLOXOPROPYLAMINE		3
NITROSODIISOBUTYLAMINE	997-95-5	3
NITROSODIMETHYLAMINE	62-75-9	3
NITROSODIMETHYLAMINE	62-75-9	17
N-NITROSODIPHENYLAMINE	86-30-6	31
NITROSODI-N-PROPYLAMINE	621-64-7	3
NITROSODITHIAZINE		3
NITROSOETHANOLISOPROPANOLAMINE		3
NITROSOETHYLCYCLOHEXYLAMINE		4
1-NITROSO-1-ETHYL-3-(2-HYDROXYETHYL)-UREA		3
1-NITROSC-1-ETHYL-3-(2-HYDROXY)UREA		17
NITROSOETHYLNITROGUANIDINE		12
NITROSOETHYLNITROGUANIDINE-D5		12
NITROSOETHYLUREA		17
NITROSOETHYLUREA	759-73-9	12
NITROSOETHYLUREA	759-73-9	3
NITROSOETHYLUREA-D5		12
NITROSOETHYLURETHANE	614-95-9	4
NITROSOETHYLURETHANE	614-95-9	8
NITROSOETHYLURETHANE	614-95-9	12
NITROSOETHYL-D5-URETHANE		3

CHEMICAL INDEX

CHEMICAL	CAS NO.	PAGE
N-NITROSO-N-ETHYLURETHANE	614-95-9	17
N-NITROSO-N-ETHYLURETHANE	614-95-9	31
NITROSO-2-FLUOROETHYLUREA	69112-98-7	12
NITROSOHEPTAMETHYLENEIMINE	20917-49-1	8
NITROSOHEPTAMETHYLENEIMINE	20917-49-1	4
NITROSOHEPTAMETHYLENEIMINE-D4		4
NITROSOHEXAMETHYLENEIMINE	932-83-2	4
NITROSO-N-HEXYLUREA	18774-85-1	12
1-NITROSO-1-(2-HYDROXYETHYL)-3-(2-CHLOROETHYL)-UREA		4
1-NITROSO-1-(2-HYDROXYETHYL)-3-ETHYLUREA		17
1-NITROSO-1-(2-HYDROXYETHYL)-3--ETHYLUREA		4
NITROSOHYDROXYETHYLUREA	13743-07-2	17
NITROSO-2-HYDROXYETHYLUREA	13743-07-2	4
NITROSO-2-HYDROXYETHYLUREA	13743-07-2	12
NITROSOHYDROXYMETHYLOXAZOLIDONE		4
NITROSOHYDROXYPROLINE	30310-80-6	11
NITROSOHYDROXYPROLINE SALT		11
NITROSOHYDROXYPROLINE SALT		11
1-NITROSO-1-(2-HYDROXYPROPYL)-3-(2-CHLOROETHYL)-UREA		4
NITROSOHYDROXYPROPYLOXOPROPYLAMINE	61499-28-3	4
NITROSOHYDROXYPROPYLOXOPROPYLAMINE		17
NITROSO-2-HYDROXYPROPYLUREA	71752-69-7	17
NITROSO-2-HYDROXYPROPYLUREA	71752-69-7	12
NITROSO-2-HYDROXYPROPYLUREA	71752-69-7	4
NITROSO-3-HYDROXYPROPYLUREA	71752-70-0	12
NITROSOISOBUTYLUREA	760-60-1	12
NITROSOISOPROPANOLETHANOLAMINE		17
NITROSO-ISOPROPYLUREA	16830-14-1	12
NITROSOMETHYLANILINE	614-00-6	4
NITROSO-N-METHYLANILINE	614-00-6	17
NITROSOMETHYLBENZYLAMINE	937-40-6	4
NITROSOMETHYLBIS-CHLOROETHYLUREA	69112-99-8	12
NITROSOMETHYL-D3-N-BUTYLAMINE		4
NITROSOMETHYL-N-BUTYLAMINE	7068-83-9	4
NITROSOMETHYL-N-BUTYL(1-D2)-AMINE		4
NITROSOMETHYLCARBOXYPROPYLAMINE		4
NITROSOMETHYL-3-CARBOXYPROPYLAMINE		4
NITROSOMETHYLCYCLOHEXYLAMINE	5432-28-0	4
NITROSOMETHYLCYCLOHEXYLAMINE-D3		4
NITROSOMETHYL-N-DECYLAMINE	7516-82-7	4
NITROSOMETHYLDIETHYLUREA	51285-72-8	17
NITROSOMETHYLDIHYDROXYPROPYLAMINE		18
NITROSOMETHYL-2,3-DIHYDROXYPROPYLAMINE		4
NITROSOMETHYLDODECYLAMINE	55090-44-3	4
NITROSOMETHYLDODECYLAMINE	55090-44-3	7
NITROSOMETHYLDODECYLAMINE	55090-44-3	8
NITROSOMETHYLDODECYLAMINE-D2		4
NITROSOMETHYLDODECYLAMINE-D3		4

CHEMICAL	CAS NO.	PAGE
N-NITROSO-N-METHYLDODECYLAMINE	75356-79-5	52
NITROSOMETHYLETHYLAMINE	10595-95-6	4
NITROSOMETHYLETHYLAMINE	10595-95-6	7
NITROSOMETHYLETHYLAMINE	10595-95-6	7
NITROSOMETHYLETHYLAMINE	10595-95-6	7
NITROSOMETHYLETHYLAMINE	10595-95-6	7
NITROSOMETHYLETHYLAMINE	10595-95-6	7
NITROSOMETHYLETHYL-(2-D3)-AMINE		18
NITROSOMETHYLETHYLAMINE-D-8		4
NITROSOMETHYLETHYLAMINE-D2		4
NITROSOMETHYLETHYLAMINE-D3		4
NITROSOMETHYLETHYLAMINE-D5		4
		4
NITROSOMETHYL-4-FLUOROANILINE	937-25-7	5
NITROSOMETHYL-N-HEPTYLAMINE	16338-99-1	5
NITROSOMETHYL-N-HEXYLAMINE	28538-70-7	5
NITROSOMETHYL-N-HEXYLAMINE	28538-70-7	18
NITROSOMETHYL-2-HYDROXYPROPYLAMINE		5
NITROSOMETHYL-2-HYDROXYPROPYLAMINE		18
NITROSO-2-METHYLMORPHOLINE	75881-16-2	18
NITROSOMETHYLNEOPENTYLAMINE	13256-07-0	5
NITROSOMETHYL-4-NITROANILINE	943-41-9	5
NITROSOMETHYLNITROGUANIDINE	70-25-7	5
NITROSOMETHYLNITROGUANIDINE	70-25-7	12
NITROSOMETHYLNITROGUANIDINE-D3		12
NITROSOMETHYL-N-NONYLAMINE	75881-19-5	5
N-NITROSO-N-METHYLOCTADECYLAMINE		52
NITROSOMETHYL-N-OCTYLAMINE	34423-54-6	5
NITROSO-5-METHYLOXAZOLIDONE	35631-27-7	5
NITROSO-5-METHYLOXAZOLIDONE	35631-27-7	12
NITROSO-5-METHYLOXAZOLIDINE	35631-27-7	18
NITROSO-5-METHYLOXAZOLIDONE	35631-27-7	18
NITROSOMETHYL-2-OXOPROPYLAMINE		5
NITROSOMETHYL-2-OXOPROPYLAMINE		18
NITROSOMETHYLPHENYLETHYLAMINE	13256-11-6	5
NITROSOMETHYLPHENYLETHYLAMINE-D2		5
NITROSOMETHYLPHENYLETHYLAMINE-D3		5
NITROSOMETHYLPIPERAZINE	109-01-3	11
NITROSOMETHYLPIPERAZINE	109-01-3	11
NITROSOMETHYLPIPERAZINE	109-01-3	11
NITROSO-3-METHYL-DELTA-3-PIPERIDINE	75881-15-1	5
NITROSOMETHYL-N-PROPYLAMINE	924-46-9	5
NITROSOMETHYL-N-TETRADECYLAMINE	75881-20-8	5
NITROSOMETHYL-2-TRIFLUOROETHYLAMINE	819-35-2	5
NITROSOMETHYLUREA	684-93-5	5
NITROSOMETHYLUREA	684-93-5	12
NITROSOMETHYLUREA-D3	68426-45-9	12
NITROSOMETHYLURETHANE	615-53-2	5

CHEMICAL INDEX

CHEMICAL	CAS NO.	PAGE
NITROSOMETHYLURETHANE	615-53-2	7
NITROSOMETHYLURETHANE	615-53-2	7
NITROSOMETHYLURETHANE	615-53-2	12
NITROSO-METHYL-D3-URETHANE		4
NITROSOMORPHOLINE		5
NITROSOMORPHOLINE	59-89-2	11
NITROSOMORPHOLINE	59-89-2	18
NITROSOMORPHOLINE-3,3,5,5-D4		18
1-NITROSONAPHTHALENE	21711-65-9	63
NITROSOOXAZOLIDINE	39884-52-1	18
NITROSO-1,3-OXAZOLIDINE	39884-52-1	5
NITROSOOXAZOLIDONE	38347-74-9	5
NITROSOOXAZOLIDONE	38347-74-9	18
NITROSOOXOPROPYLALLYLAMINE		5
NITROSOOXOPROPYLETHANOLAMINE		18
NITROSOOXOPROPYLETHANOLAMINE		5
P-NITROSOPHENETOLE	3420-97-1	63
4-NITROSOPHENOL	104-91-6	31
NITROSOPHENYLBENZYLAMINE	612-98-6	11
NITROSOPHENYLBENZYLAMINE	612-98-6	11
NITROSOPHENYLBENZYLAMINE	612-98-6	11
NITROSO-2-PHENYLETHYLUREA	777-79-7	12
NITROSOPHENYLUREA	6268-32-2	12
NITROSOPIPERIDINE	100-75-4	5
NITROSO-DELTA-2-PIPERIDINE	70501-82-5	5
NITROSO-4-PIPERIDONE	55556-91-7	5
NITROSOPROLINE	55514-93-7	11
NITROSOPROLINE	55514-93-7	11
NITROSO-N-PROPYLUREA	816-57-9	12
1-NITROSOPYRENE		63
NITROSOPYRROLIDINE	930-55-2	5
NITROSOTETRAHYDRO-1,3-OXAZINE	40548-68-3	5
NITROSOTETRAHYDROPYRIDINE	55556-92-8	5
NITROSOTHIALDINE		5
NITROSOTHIAZOLIDINE		5
NITROSO-N-TRIDECYLUREA	71752-68-6	12
NITROSOTRIETHYLUREA		18
NITROSOTRIHYDROXYDIPROPYLAMINE		18
NITROSOTRIMETHYLPIPERAZINE	75881-18-4	18
NITROSO-3,4,5-TRIMETHYLPIPERAZINE	75881-18-4	6
NITROSO-TRIS-CHLOROETHYLUREA	71162-64-6	13
NITROSO-N-UNDECYLUREA	71752-67-5	13
BETA-NITROSTYRENE	102-96-5	31
P-NITROTOLUENE	99-99-0	46
P-NITROTOLUENE	99-99-0	50
5-NITRO-O-TOLUIDINE	99-55-8	31
NITROUS OXIDE	10024-97-2	66
NITROUS OXIDE	10024-97-2	66
NITROUS OXIDE	10024-97-2	113
NONAMETHYLENEIMINE	4396-27-4	31
NONYLPHENYL DIPHENYL PHOSPHATE (NPDPP MIXED ISOMERS)	64532-97-4	32
NORDIHYDRO-GUAIARETIC ACID	500-38-9	15
NORDIHYDRO-GUAIARETIC ACID	500-38-9	16
NOREPINEPHRINE	51-41-2	99
NOREPINEPHRINE	51-41-2	105
NOSCAPINE	128-62-1	32
NTA(NITRILOTRIACETIC ACID)	139-13-9	32
NTA(NITRILOTRIACETIC ACID)	139-13-9	38
NTA(NITRILOTRIACETIC ACID)	139-13-9	40
OCHRATOXIN	37203-43-3	52
OCHRATOXIN A	303-47-9	46
OCHRATOXIN A	37203-43-3	21
OCHRATOXIN A	303-47-9	90
OCTACHLORONAPHTHALENE	2234-13-1	32
OCTAMETHYLCYCLOTETRASILOXANE	556-67-2	15
OCTAMETHYLTRISILOXANE	107-51-7	15
OCTANOIC ACID	124-07-2	32
OCTENIDINE	71251-02-0	113
2-OCTYL-3-ISOTHIAZOLONE	26530-20-1	32
P-N-OCTYLOXYBENZOIC ACID	2493-84-7	32
OIL SHALE		118
OIL SHALE PRODUCTS		118
OLEIC ACID DIETHANOLAMINE	13961-86-9	32
OLEIC ACID DIETHANOLAMINE	13961-86-9	50
OLEIC ACID DIETHANOLAMINE SALT	13961-86-9	46
OLIGOMYCIN	1404-19-9	105
OLIVE OIL		8
OLIVE OIL/RAPE SEED OIL		21
OLIVETOL	500-66-3	32
OPIATES		87
ORGANIC CHLORAMINES		120
OUABAIN	630-60-4	105
OXAMIDE	471-46-5	63
OXIDANTS		78
OXIDANTS		82
OXIDIZED LIPIDS		20
OXYGEN	7782-44-7	78
OXYGEN	7782-44-7	82
OXYGEN	7782-44-7	82
OXYGEN	7782-44-7	82
OXYGEN	7782-44-7	82
OXYGENMETABOLITES		85
OXYTETRACYCLINE HCL	2058-46-0	46
OXYTETRACYCLINE HYDROCHLORIDE	2058-46-0	50
OXYTETRACYCLINE HYDROCHLORIDE	2058-46-0	40
OZONE	0028-15-6	83

CHEMICAL INDEX

CHEMICAL	CAS NO.	PAGE
OZONE	0028-15-6	83
OZONE	10028-15-6	83
OZONE	10028-15-6	83
OZONE	10028-15-6	120
OZONE	10028-15-6	120
OZONE	10028-15-6	121
OZONE	10028-15-6	121
OZONE, ENVIRONMENTAL POLLUTANTS		83
PALYTOXIN	11077-03-5	105
PANCRATIASTATIN		19
PANCURONIUM BROMIDE	15500-66-0	75
PARACHLOROPHENYLALANINE	1991-78-2	105
PARAOXON	311-45-5	63
PARAOXON	311-45-5	63
PARAQUAT	4685-14-7	83
PARTICLES FROM OIL SHALE RETORTING		118
PARTICULATES		121
PBB'S		52
PCB'S		21
PENAMS		105
PENICILLAMINE	52-67-5	90
PENICILLAMINE	52-67-5	111
D-PENICILLAMINE	52-67-5	66
D-PENICILLAMINE	52-67-5	112
PENICILLAMINE HYDROCHLORIDE	2219-30-9	63
PENICILLIN	1406-05-9	108
PENICILLIN V POTASSIUM	132-98-9	46
PENTACHLOROANISOLE	1825-21-4	46
PENTACHLOROANISOLE	1825-21-4	52
PENTACHLOROETHANE	76-01-7	50
PENTACHLORONITROBENZENE	82-68-8	46
PENTACHLORONITROBENZENE	82-68-8	50
PENTACHLOROPHENOL	87-86-5	52
PENTACHLOROPHENOL		53
PENTACHLOROPHENOL	87-86-5	52
PENTACHLOROPHENOL, DOWICIDE EC-7	87-86-5	46
PENTACHLOROPHENOL, TECHNICAL	87-86-5	46
PENTAERYTHRITOL TETRANITRATE	78-11-5	46
PENTAETHYLENEHEXAMINE	4067-16-7	41
PENTAETHYLPENTAMINE	EMTDP-56	32
PENTAMETHYLPARAROSANILINE	603-47-4	63
PENTAMETHYLPARAROSANILINE	603-47-4	63
PENTAMIDINE	100-33-4	66
1-PENTANOL	71-41-0	32
2-PENTENENITRILE	13284-42-9	32
3-PENTENENITRILE	4635-87-4	32
PENTYLENETETRAZOL	54-95-5	105
PENTYLENETETRAZOLE	54-95-5	105

CHEMICAL	CAS NO.	PAGE
2-(P-PENTYLPHENYL)-5-(P-PENTYLOXYPHENYL) PYRIMIDINE	34913-07-0	32
PERCHLOROMETHYL MERCAPTAN	594-42-3	32
PERGOLIDE MESYLATE	66104-23-2	71
PERHYDROHISTRIONICOTOXIN	40709-29-3	105
PEROXIDASES		79
PEROXIDASES		79
PEROXIDES		83
PESTICIDES		121
PESTICIDES		121
PETROXIDASES		83
PHENACETIN-D2		63
PHENANTHRENE	85-01-8	32
PHENAZOPYRIDINE HYDROCHLORIDE	136-40-3	50
PHENESTERIN	3546-10-9	41
PHENESTERIN	3546-10-9	50
M-PHENETIDINE	621-33-0	32
P-PHENETIDINE	156-43-4	32
PHENOBARBITAL	50-06-6	63
PHENOBARBITAL	50-06-6	63
PHENOBARBITAL	50-06-6	66
PHENOBARBITAL	50-06-6	90
PHENOBARBITAL	50-06-6	94
PHENOBARBITAL	50-06-6	95
PHENOBARBITAL	50-06-6	95
PHENOBARBITAL	50-06-6	103
PHENOBARBITAL	50-06-6	105
PHENOBARBITAL	50-06-6	108
PHENOL	108-95-2	50
PHENOTHIAZINES		83
PHENOTHIAZINES (CHLORPROMAZINE)		106
PHENOXYBENZAMINE	59-96-1	106
PHENOXYBENZAMINE	59-96-1	107
PHENTERMINE	122-09-8	83
PHENYLALKYLAMINES		79
PHENYLALKYLAMINES		94
PHENYLALKYL AMINES		79
PHENYLAMIDES		102
PHENYLAMINES		85
PHENYLBUTAZONE	50-33-9	46
PHENYLCARBOXYLATES		106
O-PHENYLENEDIAMINE	95-54-5	32
M-PHENYLENEDIAMINE	108-45-2	32
P-PHENYLENEDIAMINE DIHYDROCHLORIDE	624-18-0	32
PHENYLEPHRINE HYDROCHLORIDE	61-76-7	46
PHENYL GLYCIDYL ETHER	122-60-1	32
1-PHENYL-3-METHYL-5PYRAZOLONE	89-25-8	38
N-PHENYL-1-NAPHTHYLAMINE	90-30-2	32
N-PHENYL-2-NAPHTHYLAMINE	135-88-6	46

CHEMICAL INDEX

CHEMICAL	CAS NO.	PAGE
4-PHENYLNITROSOPIPERIDINE	6652-04-6	6
O-PHENYLPHENOL	90-43-7	46
N-PHENYL-P-PHENYLENEDIAMINE	101-54-2	38
PHENYLPHOSPHINE	638-21-1	32
PHENYLPROPANOLAMINE	14838-15-4	66
PHENYLPROPANOLAMINE	14838-15-4	66
1-PHENYL-2-THIOUREA	103-85-5	38
PHENYTOIN	57-41-0	66
PHENYTOIN	57-41-0	66
PHENYTOIN	57-41-0	74
PHENYTOIN	57-41-0	106
PHENYTOIN	57-41-0	113
PHENYTOIN	57-41-0	113
PHENYTOIN	57-41-0	113
PHORBOL ESTERS		91
PHOSGENE	75-44-5	121
3'-PHOSPHOADENOSINE-5'-PHOSPHOSULFATE		64
PHOSPHONOFORMATE	63585-09-1	93
PHOSPHONOFORMATE	63585-09-1	93
PHOSPHONOFORMATE	63585-09-1	93
PHOSPHOPROTEIN PHOSPHATASES		106
PHOSPHORAMIDE		83
PHOTODIELDRIN	13366-73-9	38
PHTHALAMIDE	88-96-0	38
PHTHALAMIDE	88-96-0	50
PHTHALIC ANHYDRIDE	85-44-9	68
PHYLLANTHROSIDE	63166-73-4	19
PHYSOSTIGMINE	57-47-6	106
PHYSOSTIGMINE	57-47-6	106
PICLORAM		121
PICRIC ACID	88-89-1	38
PICROTOXIN	124-87-8	79
PICROTOXIN	124-87-8	106
PICROTOXIN	124-87-8	108
PICRYL CHLORIDE	88-88-0	32
PILOCARPINE	92-13-7	83
PILOCARPINE	92-13-7	112
PIMOZIDE	2062-78-4	106
PIPERINE	94-62-2	9
ANTI-PLATELET DRUGS		106
CIS-PLATINUM	15663-27-1	91
PLATINUM (COMPOUNDS)		91
CIS-PLATINUM COMPOUNDS		95
CIS-PLATINUM COMPOUNDS		94
CIS PLATINUM COMPOUNDS		101
POLYAMINES		113
POLYBROMINATED BIPHENYL	36355-01-8	69
POLYBROMINATED BIPHENYL (FF-I)	36355-01-8	46

CHEMICAL	CAS NO.	PAGE
POLYBROMINATED BIPHENYLS		22
POLYCHLORINATED BIPHENYL		69
POLYCHLORINATED BIPHENYLS		22
POLYCHLORINATED BIPHENYLS		22
POLYCHLORINATED BIPHENYLS		22
POLYCYCLIC HYDROCARBONS		68
POLYCYCLIC HYDROCARBONS		68
POLYETHYLPOTASSIUM 2-BENZYL-4-CHLOROPHENATE	35471-49-9	32
POLYMETHYL SILOXANE		64
POLYNUCLEAR AROMATIC HYDROCARBONS		118
POLYTHIAZIDE	346-18-9	32
POTASSIUM P-TERT AMYLPHENATE	53404-18-5	32
POTASSIUM CHLORIDE	7447-40-7	50
POTASSIUM DICHROMATE	7778-50-9	32
PRACTOLOL	6673-35-4	66
PRIMIDONE	125-33-7	94
PRIORITY AIR POLLUTANTS		121
PRIORITY AIR POLLUTANTS		121
PROBENECID	57-66-9	46
PROBENECID	57-66-9	48
PROBENECID	57-66-9	95
PROCAINAMIDE	51-06-9	66
PROCAINAMIDE	51-06-9	66
PROCAINE HYDROCHLORIDE		102
PROCARBAZINE HYDROCHLORIDE	366-70-1	32
PROCTOLIN	57966-42-4	106
PROGESTERONE	57-83-0	32
PROGESTERONE	57-83-0	64
PROMETHAZINE HYDROCHLORIDE	58-33-3	46
PROPANOL	71-23-8	106
2-PROPANOL, 1-CHLORO-, PHOSPHATE (3:1)	13674-84-5	32
PROPIONALDEHYDE	123-38-6	68
N-PROPIONYL-N-HYDROXY-2-AMINOFLUORENE	52663-84-0	64
PROPRANOLOL	525-66-6	66
PROPRANOLOL	525-66-6	106
S-(N-PROPYL)CHLOROTHIOFORMIC ACID	EMTDP-51	32
PROPYLENE	115-07-1	32
PROPYLENE CYANOHYDRIN	2567-01-3	32
PROPYLENE OXIDE	75-56-9	38
1,3-PROPYLENE OXIDE	503-30-0	38
N-PROPYL NITRITE	543-67-9	15
PROSTAGLANDIN E1	745-65-3	106
PROSTAGLANDINS		106
PSORALEN	66-97-7	52
PSYCHOTROPICS		115
PSYCHOTROPICS		115
PUROMYCIN	53-79-2	83

283<

CHEMICAL INDEX

CHEMICAL	CAS NO.	PAGE
2H-PYRAN-2-ONE, 5,6-DIHYDRO6-(3,6,13-TRIHYDOXY-3 METHYL-4-(PHOSPHONOXY)-1,7,9,-TRIDECATETRAENYL)-, MONOSODIUM SALT		19
PYRAZINE	290-37-9	15
PYRENE	129-00-0	21
PYRENE	129-00-0	32
PYRENE		64
PYRENEQUINONE	39461-53-5	64
PYRIDINE	110-86-1	46
PYRIDINE	110-86-1	79
PYRIDOXINE		74
PYRILAMINE MALEATE	59-33-6	9
PYRILAMINE	91-84-9	64
PYRILAMINE	91-84-9	64
PYRILAMINE	91-84-9	64
PYRILAMINE	91-84-9	64
PYRIMIDINE	289-95-2	95
PYRIMIDINES		106
PYRIMIDINES		99
QUERCETIN	117-39-5	46
QUESTRAN		15
QUESTRAN		16
QUINACRINE	83-89-6	9
QUINACRINE	83-89-6	9
QUINACRINE DIHYDROCHLORIDE	69-05-6	32
QUINACRINE MUSTARD	4213-45-0	32
QUINAZOLINONES		106
QUINEBIDIMYL BENZILATE		106
QUINETHAZONE (AQUAMOX)	73-49-4	33
QUINIDINE	56-54-2	79
QUINIDINE	56-54-2	95
QUINOLINE	91-22-5	50
QUINOLINES		20
QUINOLINES		20
QUINOLINES		104
RADON	10043-92-2	121
RAUWOLFIA ALKALOIDS		106
RESCINNAMINE	24815-24-5	33
RESERPINE	50-55-5	41
RESERPINE	50-55-5	64
RESERPINE	50-55-5	106
RESERPINE	50-55-5	106
RESORCINOL	108-46-3	41
RESORCINOL	108-46-3	46
RESPIRATORY SYSTEM TOXINS		83
RETINOIC ACID	302-79-4	64
13-CIS RETINOIC ACID	4759-48-2	68
TRANS RETINOIC ACID	302-79-4	68

CHEMICAL	CAS NO.	PAGE
REXARSONE	121-19-7	41
RHODAMINE 6G	989-38-3	38
RHODAMINE 6G	989-38-8	46
RIBAVIRIN	36791-04-5	93
RIBAVIRIN	36791-04-5	93
RICIN	9009-86-3	91
ROTENONE	83-79-4	38
ROTENONE	83-79-4	46
ROTENONE	83-79-4	50
ROXARSONE	121-19-7	46
ROXARSONE	121-19-7	50
RUTHENIUM	7440-18-8	79
RUTHENIUM COORDINATION COMPLEXES		79
SACCHARIN	81-07-2	52
SACCHARIN	81-07-2	64
SACCHARIN	81-07-2	64
SACCHARIN	81-07-2	64
SAFFRON	11012-59-2	15
SAFFRON	11012-59-2	16
SALICYLATES		106
SALICYLAZOSULFAPYRIDINE	599-79-1	46
SAXITOXIN	35523-89-8	104
SAXITOXIN	35523-89-8	104
SAXITOXIN	35523-89-8	106
SAXITOXIN	35523-89-8	106
SAXITOXIN	35523-89-8	107
SCOPOLAMINE	51-34-3	95
SCOPOLAMINE	51-34-3	107
SCOPOLAMINE HYDROBROMIDE	114-49-8	33
SCOPOLAMINE HYDROBROMIDE	51-34-3	46
SCOPOLAMINE HYDROBROMIDE	51-34-3	46
SCORPION VENOM		107
SECOBARBITAL	76-73-3	95
SELENIUM	7782-49-2	52
SEROTONIN	50-67-9	107
SEROTONIN	50-67-9	107
SEROTONIN	50-67-9	107
SEROTONIN	50-67-9	107
SEROTONIN	50-67-9	107
SEROTONIN	50-67-9	112
SHALE OIL PRODUCTS		118
SILICA	7631-86-9	83
SILICA	7631-86-9	83
SILVER	7440-22-4	121
SNAKE VENOM PROTEASES		85
SODIUM	17341-25-2	104
SODIUM	17341-25-2	105
SODIUM ARSENITE	7784-46-5	76
SODIUM AZIDE	26628-22-8	21

CHEMICAL INDEX

CHEMICAL	CAS NO.	PAGE
SODIUM AZIDE	26628-22-8	46
SODIUM BISULFITE DIBENZO-P-DIOXIN	7631-90-5	21
SODIUM CHLORIDE	7647-14-5	33
SODIUM CHLORIDE	7647-14-5	38
SODIUM CYANURATE	2624-17-1	33
SODIUM DIETHYLDITHIOCARBAMATE	148-18-5	38
SODIUM DODECYL SULFATE	151-21-3	38
SODIUM DODECYL SULFATE	151-21-3	46
SODIUM DODECYL SULFATE	151-21-3	50
SODIUM FLUORIDE	7681-49-4	46
SODIUM FLUORIDE	7681-49-4	50
SODIUM FLUORIDE	7681-49-4	113
SODIUM IODOMETHANESULFONATE	126-31-8	33
SODIUM NITRITE	7632-00-0	9
SODIUM NITRITE	7632-00-0	11
SODIUM SALICYLATE	54-21-7	64
SODIUM SALICYLATE	54-21-7	64
SODIUM SALICYLATE	54-21-7	64
SODIUM THIOCYANATE	540-72-7	11
SODIUM THIOCYANATE	540-72-7	11
SODIUM THIOCYANATE	540-72-7	11
SODIUM THIOCYANATE	540-72-7	11
SODIUM THIOCYANATE	540-72-7	11
SODIUM THIOCYANATE	540-72-7	11
SODIUM THIOCYANATE	540-72-7	11
SODIUM VALPROATE		74
SODIUM XYLENESULFONATE	1300-72-7	50
SOMATOSTATIN	51110-01-1	107
SOMATOSTATIN	51110-01-1	107
SORBITOL		52
SOUTHERN COPPERHEAD VENOM		85
STANNOUS CHLORIDE	7772-99-8	50
STAPHYLOCOCCAL ENTEROTOXINS		52
STEARATOCHROMIC CHLORIDE COMPLEX	15242-96-3	33
STEROIDS AND CORTICOSTEROIDS		83
STEVIOL	471-80-7	113
STREPTOMYCIN	57-92-1	97
STREPTOMYCIN	57-92-1	112
STREPTOXOTOCIN	18883-66-4	91
STREPTOZOCIN	18883-66-4	91
STREPTOZOTOCIN	18883-66-4	91
STREPTOZOTOCIN	18883-66-4	91
STREPTOZOTOCIN	18883-66-4	96
STRYCHNINE	57-24-9	107
STRYCHNINE	57-24-9	107
STRYCHNINE	57-24-9	108
STYRENE	100-42-5	33
STYRENE OXIDE	96-09-3	46

CHEMICAL	CAS NO.	PAGE
N2-SUBSTITUTED GUANINES		93
SUCCINIC ACID 2,2-DIMETHYLHYDRAZIDE	1596-84-5	50
SUCCINIC ANHYDRIDE	108-30-5	38
SUCCINIC ANHYDRIDE	108-30-5	46
SUCCINIMIDES		91
SUCROSE	57-50-1	50
SULFAMETHAZINE	57-68-1	53
SULFAMETHAZINE	57-68-1	64
SULFAMETHAZINE	57-68-1	64
SULFAMETHAZINE	57-68-1	64
SULFAMETHAZINE	57-68-1	64
SULFAMETHAZINE	57-68-1	64
SULFAMETHAZINE	57-68-1	64
SULFAMETHAZINE-N4-GLUCOSIDE		64
SULFAMETHAZINE-N4-GLUCURONIDE		64
SULFAMETHAZINE TRIAZENE		64
SULFAMETHIZOLE	144-82-1	15
SULFAMETHIZOLE	144-82-1	16
SULFANILAMIDE	63-74-1	15
SULFANILAMIDE	63-74-1	16
SULFANILAMIDE	63-74-1	91
SULFAPYRAZINE	116-44-9	108
SULFATHIAZOLE	72-14-0	15
SULFATHIAZOLE	72-14-0	16
SULFISOXAZOLE	127-69-5	33
SULFITES		102
3-SULFOLENE	77-79-2	38
4,4'-SULFONYLDIANILINE	80-08-0	50
SULFUR DIOXIDE	7446-09-5	121
SULFUR DIOXIDE	7446-09-5	121
SULFUR DIOXIDE	7466-09-5	121
SULFURIC ACID	7664-93-9	121
SUPEROXIDE ANION		112
SUPEROXIDE ANION		112
SUPEROXIDE RADICAL		112
SYNTHETIC PYRETHROIDS		108
TALC	14807-96-6	46
TENUAZONIC ACID		52
TERATOGENIC AGENTS		96
TERATOGENIC AGENTS		96
TERBUTALINE	23031-25-6	66
ALPHA-TERPINEOL	98-55-5	16
ALPHA-TERPINEOL	98-55-5	15
DELTA 1-TESTOLACTONE	968-93-4	71
TESTOSTERONE	58-22-0	64
TETANUS TOXIN		97
TETANUS TOXIN		98
TETANUS TOXIN		108

CHEMICAL INDEX

CHEMICAL	CAS NO.	PAGE
1,2,4,5-TETRABROMO-3,6-DIMETHYLBENZENE	23488-38-2	33
2,3,5,6-TETRACHLORO-4NITROANISOLE	2438-88-2	50
1,2,4,5-TETRACHLOROBENZENE	95-94-3	15
1,2,4,5-TETRACHLOROBENZENE	95-94-3	16
1,1,2,2-TETRACHLOROETHANE	79-34-5	50
TETRACHLOROETHYLENE	127-18-4	46
TETRACHLOROETHYLENE	127-18-4	46
TETRACHLOROETHYLENE	127-18-4	50
TETRACHLOROETHYLENE	127-18-4	121
TETRACHLORONAPHTHALENE	1335-88-2	33
2,3,5,6-TETRACHLORO-4-NITROANISOLE	2438-88-2	33
2,3,5,6-TETRACHLORO-4-NITROANISOLE	2438-88-2	38
2,3,4,5-TETRACHLOROPHENOL	4901-51-3	33
2,3,4,6-TETRACHLOROPHENOL	58-90-2	33
2,3,5,6-TETRACHLOROPHENOL	935-95-5	33
TETRACHLOROPHTHALIC ANHDRIDE	117-08-8	46
TETRACHROMIC ACID, POTASSIUM ZINC SALT	12433-50-0	33
TETRACYCLINE HYDROCHLORIDE	64-75-5	38
TETRACYCLINE HYDROCHLORIDE	64-75-5	41
TETRACYCLINE HYDROCHLORIDE	64-75-5	46
TETRADECANOIC ACID	544-63-8	33
TETRAETHYLENEPENTAMINE	112-57-2	41
TETRAFLUOROETHYLENE	116-14-3	33
TETRAFLUOROETHYLENE	116-14-3	46
TETRAHYDROBENZO(A)PYRENE		64
1-TRANS-DELTA-9-TETRAHYDROCANNABINOL	1972-08-3	46
DELTA-9-TETRAHYDROCANNABINOL	1972-08-3	116
1,2,3,4-TETRAHYDRO-DMBA	67242-54-0	13
TETRAHYDROFURAN	109-99-9	46
TETRAHYDROFURAN	109-99-9	47
TETRAKIS(HYDROXYMETHYL)PHOSPHONIUM CHLORIDE	124-64-1	38
TETRAKIS(HYDROXYMETHYL) PHOSPHONIUM SULFATE	55566-30-8	50
N,N,N',N'-TETRAMETHYLPARAROSANILINE		64
N,N,N',N',TETRAMETHYL-PPHENYLENEDIAMINE	100-22-1	33
TETRANITROMETHANE	509-14-8	47
1,3,6,8-TETRANITROPYRENE	28767-61-5	33
TETROCARCIN A, SODIUM SALT		19
TETRODOTOXIN	4368-28-9	79
TETRODOTOXIN	4368-28-9	79
TETRODOTOXIN	4368-28-9	99
TETRODOTOXIN	4368-28-9	102
TETRODOTOXIN	4368-28-9	103
TETRODOTOXIN	4368-28-9	104
TETRODOTOXIN	4368-28-9	105
TETRODOTOXIN	4368-28-9	108
TETRODOTOXIN	4368-28-9	108
TETRODOTOXIN	4368-28-9	108
TETRODOTOXIN ANALOGS		108

CHEMICAL	CAS NO.	PAGE
THENYLDIAMINE	91-79-2	9
THENYLDIAMINE	91-79-2	64
THEOPHYLLINE	58-55-9	47
THIABENDAZOLE	148-79-8	33
THIAZOLE	288-47-1	33
THIOACETAMIDE	62-55-5	33
THIOACETAMIDE	62-55-5	92
4,4'-THIOBIS(6-TERT-BUTYL)M-CRESOL	90-66-4	21
4,4'-THIOBIS (6-T-BUTYL-m-CRESOL)	96-69-5	68
4,4'-THIOBIS(6-TERT-BUTYL-MCRESOL)	96-69-5	47
THIOCYANATE	302-04-5	76
THIOPHANATE M	23564-05-8	33
THIOUREA	62-56-6	33
THIRAM	137-26-8	10
THPC	124-64-1	47
THPS	55566-30-8	47
TIN	7440-31-5	102
TITANIUM DIOXIDE	13463-67-7	33
TITANIUM DIOXIDE	13463-67-7	38
TITANIUM FERROCENE	1271-19-8	47
TITANIUM OXIDE	13463-67-7	50
TOBACCO		71
TOBACCO SMOKE		79
TOBACCO SMOKE		83
TOBACCO SMOKE		84
TOBRAMYCIN	32986-56-4	92
TOBRAMYCIN	32986-56-4	97
TOBRAMYCIN	32986-56-4	112
TOBRAMYCIN	32986-56-4	112
D-ALPHA-TOCOPHEROL SUCCINATE	4345-03-3	33
D-ALPHA-TOCOPHERYL ACETATE	58-95-7	47
TOLAZAMIDE	1156-19-0	33
TOLBUTAMIDE	64-77-7	10
TOLBUTAMIDE	64-77-7	38
O-TOLUALDEHYDE	529-20-4	33
TOLUENE	108-88-3	47
TOLUENE	108-88-3	50
TOLUENE (NITRATION GRADE)	108-88-3	38
TOLUENE (TECHNICAL)	108-88-3	38
2,6-TOLUENEDIAMINE DIHYDROCHLORIDE	15481-70-6	33
2,6-TOLUENEDIAMINE DIHYDROCHLORIDE	15481-70-6	50
2,5-TOLUENEDIAMINE SULFATE	6369-59-1	33
2,5-TOLUENEDIAMINE SULFATE	6369-59-1	39
TOLUENE DIISOCYANATE	26471-62-5	84
M-TOLUIDINE	108-44-1	33
M-TOLUIDINE HYDROCHLORIDE	638-03-9	34
P-TOLUNITRILE	104-85-8	34
TOXALBUMINS		84

CHEMICAL INDEX

CHEMICAL	CAS NO.	PAGE
TOXIN B (CHLOSTRIDIUM		92
TPA	41479-14-5	44
TRANQUILIZERS		106
TRIALKYL LEAD AND TIN COMPOUNDS		21
TRIALLYL ISOCYANURATE	1025-15-6	34
TRIAMCINOLONE		112
TRIAMCINOLONE		112
TRIAMCINOLONE HEXACETONIDE	5611-51-8	113
TRIAMTERENE	396-01-0	47
TRIBENZYL ISOCYANURATE	606-03-1	34
TRIBROMOACETONITRILE		34
2,4,6-TRIBROMOPHENYL CARBONATE	67990-32-3	34
TRI-SEC-BUTANOLAMINE	2421-02-5	34
TRICHLORFON	52-68-6	39
TRICHLORFON	52-68-6	47
TRICHLOROBENZOIC ACIDS	1319-85-3	108
TRICHLOROETHYLENE	79-01-6	47
TRICHLOROETHYLENE	79-01-6	47
TRICHLOROETHYLENE	79-01-6	47
TRICHLOROETHYLENE	79-01-6	47
TRICHLOROETHYLENE	79-01-6	121
TRICHLOROETHYLENE (WITHOUT EPICHLOROHYDR)	79-01-6	47
TRICHLOROETHYLENE (WITHOUT EPICHLOROHYDR)	79-01-6	47
TRICHLOROMELAMINE	7673-09-8	34
2,3,4-TRICHLORONITROBENZENE	17700-09-3	34
2,4,5-TRICHLORONITROBENZENE	89-69-0	34
2,4,6-TRICHLORONITROBENZENE	18708-70-8	34
3,4,6-TRICHLORO-2-NITROPHENOL	82-62-2	34
2,3,5-TRICHLOROPHENOL	933-78-8	34
2,3,6-TRICHLOROPHENOL	933-75-5	34
3,4,5-TRICHLOROPHENOL	609-19-8	34
2,3,4-TRICHLOROPHENYL	15950-66-0	34
1,2,3-TRICHLOROPROPANE	96-18-4	47
TRICRESYL PHOSPHATE	1330-78-5	47
TRIETHANOLAMINE	102-71-6	47
TRIETHANOLAMINE	102-71-6	68
TRIETHYLAMINE	121-44-8	79
TRIETHYLENE GLYCOL DIGLYCIDYL ETHER	1954-28-5	34
TRIETHYLENETETRAMINE	112-24-3	41
TRIETHYLNITROSOUREA	50285-70-6	6
5'-TRIFLUOROMETHYL-5'-AMINO2',5'-DIDEOXYURIDINE (AF3U)		112
TRIFLUOROTHYMIDINE	70-00-8	34
TRIFLUOROTHYMIDINE	70-00-8	112
TRIGONELLINE	535-83-1	15
1,8,9-TRIHYDROXYANTHRACENE	480-22-8	34
2,4,5-TRIMETHOXYBENZALDEHYDE	4460-86-0	39
2,4,5-TRIMETHOXYBENZALDEHYDE	4460-86-0	50
2,4,5-TRI-METHOXY BENZALDEHYDE	4460-86-0	68

CHEMICAL	CAS NO.	PAGE
TRIMETHYL ISOCYANURATE	827-16-7	34
TRIMETHYLNITROSOUREA	3475-63-6	6
TRIMETHYLOXONIUM	43625-65-6	108
TRIMETHYL-PSORALEN	3902-71-4	52
TRIMETHYLTHIOUREA	2489-77-2	39
TRIMETHYLTHIOUREA	2489-77-2	50
2,4,6-TRINITROANILINE	489-98-5	34
1,3,6-TRINITROPYRENE	75321-19-6	34
2,4,6-TRINITROTOLUENE	118-96-7	34
TRIORTHOCRESYL PHOSPHATE	78-30-8	68
TRIPHENYL ANTIMONY	603-36-1	15
TRIPHENYL PHOSPHATE	115-86-6	52
TRIPHENYL PHOSPHATE	115-86-6	52
TRIPHENYLTIN HYDROXIDE	76-87-9	34
TRIPHENYLTIN HYDROXIDE	76-87-9	39
TRI-N-PROPYLAMINE	102-69-2	34
TRIS(CARBAMOYLMETHYL)ISOCYANURATE	1843-48-7	34
TRIS(2-CHLOROETHYL) PHOSPHATE	115-96-8	47
TRIS(3-CHLORO-2-HYDROXYPROPYL)ISOCYANURATE	7423-53-2	34
TRIS(2,3-EPOXYPROPYL)-ISOCYANURATE	2451-62-9	34
TRIS(2-ETHYLHEXYL)TRIMELLITATE	3319-31-1	34
1,3,5-TRIS(2-HYDROXYETHYL)TRIAZINE-2,4,6-TRIONE	839-90-7	34
TRIS(2-KETOPROPYL)ISOCYANURATE	61050-97-3	34
TRIS(TRIPHENYLSTANNYL)ISOCYANURATE	752-74-9	34
TRITIUM	10028-17-8	97
TRITIUM	10028-17-8	99
TRITIUM	10028-17-8	108
O-TRITOLYL PHOSPHATE	78-30-8	34
P-TRITOLYL PHOSPHATE	78-32-0	34
TUMERIC (CURCUMIN)	458-37-7	47
TUNGSTEN CARBIDE	12070-12-1	47
TYRAMINE		101
URANIUM-238		121
URETHANE	51-79-6	34
UROTROPINE	100-97-0	34
VALERONITRILE	110-59-8	34
VALPROIC ACID	99-66-1	96
VANADATE		112
VANADIUM PENTOXIDE	1314-62-1	68
VARIANT III SCORPION TOXIN		113
VENOM		105
VENOMS		97
VENOMS		105
VERAPAMIL	52-53-9	35
VERAPAMIL	52-53-9	66
VERAPAMIL	52-53-9	79
VERAPAMIL	52-53-9	79
VERATRIDINE	71-62-5	108

CHEMICAL INDEX

CHEMICAL	CAS NO.	PAGE	CAS NO.	PAGE
VIDARABINE (ARA-A)		112		
VINBLASTINE	865-21-4	108		
VINYL ACETATE	108-05-4	6		
VINYL CHLORIDE	75-01-4	20		
4-VINYLCYCLOHEXENE	100-40-3	47		
4-VINYLCYCLOHEXENE	100-40-3	39		
4-VINYLCYCLOHEXENE	100-40-3	50		
VINYL CYCLOHEXENE DIOXIDE	106-87-6	47		
1-VINYL-4-(DIETHYLDIAMINE)PIPERAZINE	EMTDP-58	35		
VINYLIDENE CHLORIDE (1,1DICHLOROETHYLENE	75-35-4	50		
VINYLIDENE CHLORIDE (1,1-DICHLOROETHYLENE)	75-35-4	39		
VINYLIDENE FLUORIDE	75-38-7	35		
VINYLIDENE FLUORIDE	75-38-7	39		
VINYLIDINE FLUORIDE	75-38-7	47		
VINYLTOLUENE	25013-15-4	47		
VINYL TOLUENE	25013-15-4	39		
VITAMIN A	68-26-8	113		
VITAMIN D	1406-16-2	35		
VITAMIN D	1406-16-2	113		
VITAMIN E		52		
VITAMIN E ACETATE	7695-91-2	66		
VOLATILE ORGANIC DRINKING WATER CONTAMINANTS		121		
VOMITOXIN	17924-92-4	52		
WATER	7732-18-5	35		
WOLLASTONITE CALCIUM SILICATE	13983-17-0	47		
WR 2721	20537-88-6	84		
XANTHENES		94		
XYLENE	1330-20-7	47		
XYLENES, COMMERCIAL MIXTURE	1330-20-7	35		
XYLENESULFONIC ACID, SODIUM SALT	1300-72-7	47		
XYLITOL		52		
ZEARALENONE	17924-92-4	52		
ZINC COMPOUNDS		100		
ZINC NAPHTHENATE	12001-85-3	15		
ZINC PYRIDINETHIONE		74		
ZIRCONOCENE DICHLORIDE	1291-32-3	35		

CAS Registry Number Index

CAS NUMBER INDEX

CAS	PAGE	CAS	PAGE	CAS	PAGE	CAS	PAGE
50-00-0	67	50-67-9	107	51-84-3	107	55-18-5	7
50-00-0	97	50-67-9	107	52-53-9	35	55-18-5	7
50-00-0	113	50-67-9	107	52-53-9	66	55-18-5	31
50-02-2	57	50-67-9	107	52-53-9	79	55-31-2	44
50-02-2	57	50-67-9	107	52-53-9	79	55-63-0	105
50-02-2	110	50-67-9	112	52-67-5	66	56-23-0	119
50-06-6	63	50-71-5	23	52-67-5	90	56-23-5	25
50-06-6	63	50-76-0	54	52-67-5	111	56-23-5	88
50-06-6	66	50-78-2	23	52-67-5	112	56-23-5	119
50-06-6	90	50-78-2	75	52-68-6	39	56-49-5	90
50-06-6	94	50-78-2	86	52-68-6	47	56-53-1	57
50-06-6	95	50-78-2	88	52-86-8	106	56-53-1	57
50-06-6	95	50-81-7	48	52-90-4	14	56-53-1	57
50-06-6	103	50-81-7	51	52-90-4	16	56-53-1	70
50-06-6	105	50-81-7	55	53-06-5	113	56-53-1	70
50-06-6	108	51-06-9	66	53-06-5	113	56-53-1	94
50-18-0	36	51-06-9	66	53-79-2	83	56-54-2	79
50-18-0	56	51-17-2	24	53-86-1	106	56-54-2	95
50-18-0	74	51-21-8	110	53-86-1	111	56-55-3	55
50-18-0	81	51-21-8	110	53-94-1	60	56-55-3	55
50-18-0	88	51-21-8	110	53-94-1	60	56-65-5	94
50-18-0	100	51-28-5	27	53-94-1	60	56-65-5	98
50-18-0	113	51-34-3	46	53-95-2	59	56-69-9	107
50-23-7	56	51-34-3	46	53-95-2	59	56-69-9	107
50-28-2	58	51-34-3	95	53-96-3	54	56-72-4	25
50-28-2	58	51-34-3	107	53-96-3	54	56-72-4	36
50-28-2	58	51-41-2	99	53-96-3	54	56-72-4	48
50-28-2	58	51-41-2	105	53-96-3	54	56-75-7	74
50-28-2	58	51-43-4	28	53-96-3	54	57-06-7	48
50-29-3	69	51-43-4	102	53-96-3	54	57-24-9	107
50-29-3	100	51-45-6	101	53-96-3	54	57-24-9	107
50-32-8	36	51-45-6	111	54-11-5	74	57-24-9	108
50-32-8	40	51-61-6	89	54-11-5	76	57-27-2	102
50-32-8	55	51-61-6	95	54-11-5	76	57-41-0	44
50-32-8	55	51-61-6	99	54-21-7	64	57-41-0	58
50-32-8	88	51-61-6	101	54-21-7	64	57-41-0	58
50-33-9	46	51-61-6	101	54-21-7	64	57-41-0	58
50-41-9	71	51-61-6	107	54-31-9	44	57-41-0	58
50-44-2	100	51-63-8	55	54-31-9	49	57-41-0	66
50-47-5	87	51-63-8	55	54-31-9	87	57-41-0	66
50-49-7	82	51-79-6	34	54-31-9	87	57-41-0	74
50-53-3	81	51-83-2	99	54-42-2	111	57-41-0	76
50-53-3	88	51-84-3	97	54-85-3	90	57-41-0	96
50-53-3	99	51-84-3	97	54-95-5	102	57-41-0	99
50-55-5	41	51-84-3	97	54-95-5	105	57-41-0	99
50-55-5	64	51-84-3	104	54-95-5	105	57-41-0	100
50-55-5	106	51-84-3	104	55-18-5	2	57-41-0	100
50-55-5	106	51-84-3	105	55-18-5	7	57-41-0	102

CAS NUMBER INDEX

CAS	PAGE
57-41-0	106
57-41-0	108
57-41-0	113
57-41-0	113
57-41-0	113
57-41-0	113
57-41-0	113
57-41-0	113
57-47-6	106
57-47-6	106
57-50-1	50
57-63-6	28
57-66-9	46
57-66-9	68
57-66-9	95
57-68-1	53
57-68-1	64
57-68-1	64
57-68-1	64
57-68-1	64
57-68-1	64
57-68-1	64
57-83-0	32
57-83-0	64
57-88-5	99
57-88-5	99
57-88-5	99
57-92-1	97
57-92-1	112
57-97-6	44
57-97-6	44
57-97-6	57
57-97-6	57
57-97-6	57
57-97-6	57
57-97-6	113
58-00-4	98
58-08-2	51
58-08-2	51
58-08-2	51
58-08-2	51
58-08-2	76
58-08-2	76
58-08-2	76
58-08-2	99
58-22-0	64
58-25-3	9
58-32-2	100
58-33-3	46
58-54-8	101
58-55-9	47
58-89-9	60
58-89-9	60
58-89-9	60
58-89-9	60
58-90-2	33
58-93-5	9
58-93-5	9
58-93-5	44
58-94-6	25
58-95-7	47
59-01-8	97
59-01-8	111
59-05-2	95
59-05-2	111
59-05-2	111
59-05-2	113
59-14-3	109
59-33-6	9
59-87-0	38
59-87-0	46
59-89-2	11
59-89-2	18
59-92-7	90
59-92-7	101
59-92-7	101
59-92-7	107
59-96-1	106
59-96-1	107
60-11-7	27
60-13-9	40
60-13-9	42
60-23-1	77
60-23-1	89
60-23-1	89
60-57-1	37
60-92-4	100
61-76-7	46
61-82-5	24
61-82-5	36
61-82-5	48
62-44-2	85
62-50-0	58
62-50-0	58
62-55-5	33
62-55-5	92
62-56-6	33
62-73-7	26
62-73-7	43
62-75-9	3
62-75-9	17
62-75-9	57
62-75-9	89
63-74-1	15
63-74-1	16
63-74-1	91
64-17-5	74
64-17-5	74
64-17-5	76
64-17-5	76
64-17-5	76
64-17-5	78
64-17-5	97
64-17-5	113
64-69-7	29
64-75-5	38
64-75-5	41
64-75-5	46
64-77-7	10
64-77-7	38
64-86-8	99
64-86-8	99
64-86-8	100
65-50-0	58
65-85-0	24
66-27-3	62
66-27-3	62
66-27-3	62
66-81-9	26
66-97-7	52
67-20-9	46
67-20-9	50
67-20-9	66
67-20-9	66
67-20-9	82
67-20-9	82
67-20-9	82
67-63-0	67
67-64-1	67
67-64-1	67
67-66-3	86
67-68-5	27
67-72-1	44
67-72-1	49
68-12-2	37
68-12-2	57
68-12-2	67
68-26-8	113
69-05-6	32
69-65-8	49
70-18-8	14
70-00-8	34
70-00-8	112
70-18-8	16
70-25-7	5
70-25-7	12
70-25-7	45
70-30-4	101
71-23-8	106
71-41-0	32
71-43-2	22
71-62-5	108
72-14-0	15
72-14-0	16
72-20-8	37
72-20-8	49
72-55-9	21
72-55-9	48
73-49-4	33
74-31-7	27
74-83-9	22
74-83-9	30
74-83-9	45
74-90-8	29
74-96-4	37
74-96-4	44
75-00-3	28
75-00-3	44
75-01-4	20
75-04-7	78
75-05-8	42
75-07-0	14
75-07-0	16
75-07-0	36
75-07-0	67
75-07-0	76
75-09-2	45
75-09-2	48
75-15-0	36
75-15-0	67
75-15-0	67
75-15-0	74

290<

CAS NUMBER INDEX

CAS	PAGE
75-21-8	28
75-21-8	37
75-21-8	44
75-25-2	42
75-27-4	42
75-31-0	78
75-35-4	39
75-35-4	50
75-38-7	35
75-38-7	39
75-38-7	47
75-44-5	121
75-56-9	38
75-65-0	42
75-65-0	67
76-01-7	50
76-38-0	30
76-44-8	49
76-57-3	43
76-73-3	95
76-87-9	34
76-87-9	39
76-99-3	66
77-47-4	38
77-47-4	44
77-65-6	36
77-67-8	94
77-79-2	38
78-11-5	46
78-30-8	34
78-30-8	68
78-32-0	34
78-44-4	36
78-44-4	42
78-59-1	45
78-79-5	38
78-79-5	40
78-79-5	45
78-83-1	29
78-84-2	45
78-84-2	49
78-88-6	26
78-89-7	25
78-93-3	30
78-93-3	68
78-96-6	40
79-01-6	47
79-01-6	47
79-01-6	47
79-01-6	47
79-01-6	47
79-01-6	47
79-01-6	121
79-02-7	26
79-06-1	99
79-06-1	105
79-11-8	40
79-11-8	45
79-34-5	50
80-05-7	48
80-08-0	50
80-62-6	45
81-07-2	52
81-07-2	64
81-07-2	64
81-07-2	64
81-11-8	43
81-20-9	27
81-49-2	42
81-55-0	37
81-55-0	40
82-28-0	23
82-62-2	34
82-68-8	46
82-68-8	50
82-92-8	81
82-93-9	80
83-41-0	27
83-43-2	102
83-43-2	106
83-72-7	40
83-79-4	38
83-79-4	46
83-79-4	50
83-89-6	9
83-89-6	9
84-65-1	24
84-66-2	43
84-79-7	16
85-01-8	32
85-02-9	21
85-02-9	42
85-44-9	68
85-68-7	42
85-68-7	48
85-84-7	14
85-98-3	26
86-30-6	31
86-54-4	65
86-54-4	65
86-57-7	62
86-72-6	25
87-68-3	44
87-86-5	46
87-86-5	46
87-86-5	52
87-86-5	52
88-21-1	23
88-23-3	23
88-88-0	32
88-89-1	38
88-96-0	38
88-96-0	50
89-25-8	38
89-58-7	27
89-62-3	30
89-63-4	43
89-63-4	48
89-69-0	34
89-87-2	27
90-30-2	32
90-43-7	46
90-66-4	21
90-94-8	30
91-20-3	45
91-22-5	50
91-23-6	45
91-34-9	14
91-34-9	16
91-59-8	62
91-64-5	43
91-68-9	26
91-79-2	9
91-79-2	64
91-80-5	9
91-80-5	9
91-80-5	60
91-84-9	64
91-84-9	64
91-84-9	64
91-84-9	64
92-13-7	83
92-13-7	112
92-36-4	30
92-67-1	54
92-87-5	58
92-93-3	62
93-05-0	26
93-43-6	31
93-45-8	31
93-46-9	27
93-98-9	27
94-20-2	36
94-62-2	9
95-19-2	15
95-19-2	16
95-50-1	48
95-54-5	32
95-79-4	48
95-84-1	23
95-85-2	23
95-94-3	15
95-94-3	16
96-09-3	46
96-12-8	21
96-12-8	37
96-12-8	89
96-13-9	43
96-18-4	47
96-23-1	26
96-45-7	40
96-45-7	44
96-45-7	49
96-48-0	36
96-48-0	42
96-67-3	24
96-69-5	47
96-69-5	68
96-91-3	23
96-93-5	23
96-98-0	30
97-02-9	27
97-02-9	37
97-53-0	40
97-54-1	15
97-54-1	16
97-59-6	9
97-59-6	9
97-77-8	9
98-01-1	44
98-01-1	67
98-11-3	24

CAS NUMBER INDEX

CAS	PAGE
98-30-6	23
98-37-3	24
98-55-5	15
98-55-5	16
98-56-6	14
98-56-6	16
98-85-1	38
98-85-1	45
98-85-1	49
98-88-4	24
98-88-4	42
99-12-7	27
99-30-9	26
99-30-9	40
99-51-4	27
99-52-5	30
99-54-7	37
99-55-8	31
99-56-9	38
99-57-0	42
99-66-1	96
99-66-1	100
99-97-8	14
99-99-0	46
99-99-0	50
112-55-0	14
112-55-0	16
102-06-7	14
106-93-4	89
107-13-1	88
108-90-7	36
124-64-1	38
144-82-1	15
100-02-7	38
100-02-7	46
100-02-7	63
100-15-2	30
100-22-1	33
100-33-4	66
100-40-3	39
100-40-3	47
100-40-3	50
100-41-4	67
100-42-5	33
100-44-7	36
100-44-7	42
100-47-0	42
100-51-6	42
100-51-6	65
100-51-6	67
100-52-7	42
100-52-7	67
100-61-8	61
100-75-4	5
100-90-3	54
100-90-3	54
100-97-0	34
101-05-3	24
101-54-2	38
101-67-7	27
101-70-2	27
101-73-5	29
101-77-9	30
101-90-6	48
101-96-2	28
102-06-7	16
102-50-1	25
102-54-5	14
102-69-2	34
102-71-6	47
102-71-6	68
102-96-5	31
103-23-1	48
103-70-8	29
103-85-5	38
103-89-9	23
103-90-2	45
103-90-2	54
103-90-2	75
103-90-2	88
103-90-2	109
104-30-3	31
104-55-2	56
104-55-2	56
104-55-2	67
104-75-6	28
104-76-7	37
104-85-8	34
104-91-6	31
105-55-5	48
106-20-7	26
106-41-2	86
106-46-7	43
106-46-7	48
106-47-8	43
106-47-8	48
106-87-6	47
106-88-7	44
106-88-7	49
106-89-8	89
106-90-1	29
106-91-2	29
106-92-3	42
106-93-4	57
106-99-0	14
106-99-0	23
106-99-0	24
106-99-0	36
106-99-0	40
106-99-0	42
107-02-8	2
107-02-8	80
107-02-8	80
107-05-1	54
107-06-3	67
107-11-9	78
107-13-1	20
107-13-1	40
107-13-1	88
107-18-6	2
107-18-6	17
107-21-1	37
107-21-1	44
107-29-9	2
107-51-7	15
107-92-6	25
108-01-0	40
108-05-4	6
108-10-1	68
108-30-5	38
108-30-5	46
108-44-1	33
108-45-2	32
108-46-3	41
108-46-3	46
108-60-1	48
108-78-1	49
108-86-1	42
108-86-1	42
108-86-1	86
108-86-1	86
108-86-1	86
108-86-1	86
108-88-3	38
108-88-3	38
108-88-3	47
108-88-3	50
108-88-3	120
108-94-1	43
108-95-2	50
109-01-3	11
109-01-3	11
109-01-3	11
109-57-9	23
109-69-3	42
109-86-4	68
109-89-7	78
109-99-9	46
109-99-9	47
110-00-9	37
110-00-9	40
110-00-9	44
110-00-9	49
110-21-4	24
110-21-4	36
110-46-3	15
110-54-3	74
110-59-8	34
110-80-5	44
110-80-5	49
110-86-1	46
110-86-1	79
110-91-8	11
111-30-8	44
111-30-8	51
111-30-8	67
111-35-3	67
111-41-1	40
111-42-2	37
111-42-2	43
111-42-2	43
111-42-2	67
111-44-4	40
111-69-3	23
111-96-6	67
112-24-3	41
112-56-1	24
112-57-2	41
113-45-1	102
113-92-8	9
113-92-8	9
113-92-8	36

CAS NUMBER INDEX

CAS	PAGE	CAS	PAGE	CAS	PAGE	CAS	PAGE
113-92-8	43	121-59-5	25	130-26-7	29	148-18-5	38
113-92-8	48	121-69-7	37	131-11-3	44	148-65-2	9
114-26-1	15	121-69-7	44	131-11-3	67	148-79-8	33
114-26-1	16	121-75-5	49	131-17-9	48	149-30-4	45
114-49-8	33	121-88-0	42	131-57-7	45	149-30-4	49
115-07-1	32	122-04-3	38	131-57-7	45	149-57-5	37
115-09-3	30	122-09-8	83	132-98-9	46	150-38-9	37
115-09-3	62	122-60-1	32	133-90-4	36	150-38-9	49
115-28-6	36	123-05-7	28	134-31-6	29	150-68-5	9
115-28-6	42	123-31-9	40	134-32-7	62	151-21-3	38
115-86-6	52	123-31-9	44	134-50-9	42	151-21-3	46
115-86-6	52	123-38-6	68	134-62-3	67	151-21-3	50
115-96-8	47	123-72-8	42	134-72-5	37	151-67-7	87
116-06-3	23	123-72-8	42	134-72-5	44	151-67-7	90
116-14-3	33	123-72-8	67	134-72-5	49	151-67-7	101
116-14-3	46	123-77-3	22	135-23-9	8	151-67-7	101
116-44-9	108	123-77-3	36	135-23-9	17	153-78-6	54
117-08-8	46	123-77-3	42	135-23-9	49	153-78-6	54
117-39-5	46	123-86-4	56	135-88-6	46	154-93-8	114
118-52-5	22	123-88-6	30	136-40-3	50	156-43-4	32
118-71-8	40	123-91-1	49	136-77-6	44	156-59-2	26
118-74-1	38	123-91-1	51	137-09-7	43	192-97-2	24
118-96-7	34	124-07-2	32	137-26-8	10	271-89-6	42
119-31-3	27	124-09-4	44	137-58-6	78	288-47-1	33
119-32-4	30	124-64-1	47	137-58-6	102	289-95-2	95
119-75-5	31	124-87-8	79	137-89-3	24	290-37-9	15
119-84-6	43	124-87-8	106	139-13-9	32	298-46-4	94
119-90-4	44	124-87-8	108	139-13-9	38	298-46-4	95
119-90-4	57	125-33-7	94	139-13-9	40	298-46-4	99
119-93-7	44	126-07-8	29	140-11-4	42	298-46-4	99
119-93-7	57	126-07-8	101	140-11-4	48	298-59-9	45
120-12-7	51	126-31-8	33	140-49-8	25	298-81-7	45
120-32-1	21	126-98-7	40	140-49-8	36	298-81-7	52
120-32-1	42	126-99-8	36	141-32-2	56	298-81-7	52
120-40-1	45	127-00-4	25	141-38-8	28	299-42-3	65
120-40-1	49	127-00-4	40	141-43-5	67	300-62-9	65
120-61-6	37	127-18-4	46	141-78-6	28	302-04-5	76
120-71-8	26	127-18-4	46	142-47-2	31	302-17-0	36
120-83-2	43	127-18-4	50	143-07-7	29	302-79-4	64
121-14-2	37	127-18-4	121	143-50-0	21	302-79-4	68
121-19-7	41	127-33-3	89	144-82-1	16	303-34-4	38
121-19-7	46	127-69-5	33	147-24-0	9	303-47-9	46
121-19-7	50	128-37-0	48	147-24-0	9	303-47-9	90
121-44-8	79	128-37-0	80	147-24-0	37	303-49-1	81
121-47-1	23	128-37-0	109	147-24-0	44	305-03-3	36
121-54-0	42	128-62-1	32	147-24-0	49	311-45-5	63
121-54-0	67	129-00-0	21	147-47-7	43	311-45-5	63
121-57-3	23	129-00-0	32	147-94-4	26	313-05-3	100

294<

CAS NUMBER INDEX

CAS PAGE
313-05-3 100
315-18-4 30
316-14-3 61
316-49-4 61
317-34-0 74
320-67-2 14
320-67-2 16
320-67-2 24
320-67-2 36
327-97-1 14
329-89-5 113
331-39-5 14
333-27-7 30
333-41-5 36
333-41-5 48
334-48-5 26
346-18-9 32
366-70-1 32
389-08-2 38
389-08-2 45
396-01-0 47
421-20-5 15
428-59-1 28
434-13-9 29
439-14-5 100
439-14-5 100
443-48-1 30
446-86-6 24
446-86-6 88
446-86-6 100
458-37-7 47
461-78-9 81
461-89-2 94
463-04-7 14
464-10-8 24
465-65-6 102
469-21-6 58
469-21-6 58
469-21-6 58
469-21-6 58
470-82-6 56
470-82-6 56
470-82-6 56
470-82-6 56
471-46-5 63
471-80-7 113
476-66-4 14
476-66-4 16

CAS PAGE
477-30-5 100
480-22-8 34
484-20-8 52
485-49-4 98
487-79-6 95
487-79-6 95
487-79-6 101
488-41-5 37
489-98-5 34
493-78-9 9
496-72-0 26
497-04-1 25
514-10-3 14
500-38-9 15
500-38-9 16
500-66-3 32
501-92-8 14
503-09-3 28
503-30-0 38
504-88-1 31
509-14-8 47
510-15-6 48
513-37-1 40
513-37-1 44
514-10-3 16
518-75-2 51
521-31-3 29
525-66-6 66
525-66-6 106
527-62-8 23
529-20-4 33
531-06-6 9
532-27-4 43
532-82-1 40
535-83-1 15
536-33-4 28
537-92-8 23
540-72-7 11
540-72-7 11
540-72-7 11
540-72-7 11
540-72-7 11
540-72-7 11
540-72-7 11
542-56-3 15
542-56-3 45
542-75-6 37
542-78-9 45

CAS PAGE
542-78-9 67
543-67-9 15
544-16-1 14
544-16-1 16
544-63-8 33
548-62-9 40
548-62-9 53
548-62-9 59
548-62-9 59
548-62-9 59
551-06-4 31
552-16-9 31
555-30-6 21
555-30-6 38
555-30-6 45
555-30-6 49
555-30-6 66
555-30-6 66
555-48-6 23
556-52-5 40
556-52-5 44
556-67-2 15
563-47-3 36
563-47-3 43
569-61-9 43
570-24-1 30
578-46-1 30
578-76-7 62
583-39-1 38
583-39-1 45
583-39-1 49
584-79-2 97
591-33-3 28
594-42-3 32
594-71-8 25
597-25-1 40
597-25-1 44
598-55-0 21
598-55-0 40
598-55-0 45
598-55-0 49
599-79-1 46
600-25-9 25
602-38-0 27
602-60-8 31
602-60-8 38
603-36-1 15
603-47-4 63

CAS PAGE
603-47-4 63
603-50-9 65
603-54-3 28
603-83-8 30
605-71-0 27
606-03-1 34
606-37-1 27
607-30-7 60
607-30-7 60
607-57-8 62
609-19-8 34
609-31-4 31
610-14-0 31
611-06-3 37
612-82-8 27
612-98-6 11
612-98-6 11
612-98-6 11
613-13-8 36
613-47-8 60
613-47-8 60
613-47-8 60
614-00-6 4
614-00-6 17
614-45-9 22
614-45-9 36
614-45-9 42
614-95-9 4
614-95-9 8
614-95-9 12
614-95-9 17
614-95-9 31
615-53-2 5
615-53-2 7
615-53-2 7
615-53-2 12
619-17-0 38
619-23-8 31
621-33-0 32
621-42-1 23
621-42-1 90
621-64-7 3
621-90-9 61
624-18-0 32
625-48-9 31
627-30-5 25
630-08-0 119
630-08-0 119

295<

CAS NUMBER INDEX

CAS	PAGE	CAS	PAGE	CAS	PAGE	CAS	PAGE
630-60-4	105	924-43-6	14	1300-72-7	47	1643-20-5	9
635-65-4	86	924-46-9	5	1300-72-7	50	1643-20-5	9
637-07-0	56	930-22-3	28	1313-27-5	31	1675-54-3	36
637-07-0	56	930-37-0	30	1313-27-5	45	1719-53-5	26
637-07-0	56	930-55-2	5	1313-27-5	49	1759-58-6	27
637-07-0	56	932-83-2	4	1313-99-1	45	1772-25-4	29
638-03-9	34	933-75-5	34	1314-62-1	68	1825-21-4	46
638-21-1	32	933-78-8	34	1317-36-8	67	1825-21-4	52
643-22-1	37	934-32-7	23	1317-87-0	67	1843-48-7	34
643-22-1	44	935-69-3	61	1319-85-3	108	1854-26-8	40
643-22-1	49	935-95-5	33	1325-37-7	43	1854-26-8	44
645-62-5	28	937-25-7	5	1330-20-7	35	1897-45-6	48
684-93-5	5	937-40-6	4	1330-20-7	47	1910-42-5	49
684-93-5	12	943-41-9	5	1330-78-5	47	1912-24-9	24
684-93-5	62	958-74-7	62	1332-21-4	80	1934-21-0	51
686-68-0	27	968-93-4	71	1332-21-4	119	1936-15-8	14
689-13-4	94	982-57-0	40	1332-58-7	82	1937-37-7	58
745-65-3	106	989-38-3	38	1332-58-7	82	1951-25-3	65
752-74-9	34	989-38-8	46	1335-87-1	29	1954-28-5	34
756-79-6	40	992-59-6	58	1335-88-2	33	1972-08-3	46
756-79-6	44	997-95-5	3	1336-93-2	15	1972-08-3	116
759-73-9	3	999-81-5	36	1338-02-9	14	1975-50-4	30
759-73-9	12	1260-17-9	14	1338-23-4	36	1975-52-6	30
759-73-9	21	1260-17-9	16	1338-23-4	42	1982-37-2	45
759-73-9	58	1403-66-3	110	1397-89-3	24	1991-78-2	105
759-73-9	118	1406-16-2	113	1399-60-6	101	2004-04-8	94
759-94-4	28	0028-15-6	83	1402-68-2	51	2016-88-8	23
760-56-5	12	0028-15-6	83	1402-68-2	51	2039-87-4	25
760-60-1	12	1025-15-6	34	1402-68-2	51	2058-46-0	40
768-52-5	29	1067-33-0	37	1402-68-2	54	2058-46-0	46
775-11-1	12	1067-33-0	48	1403-66-3	90	2058-46-0	50
777-79-7	12	1072-52-2	36	1403-66-3	90	2062-78-4	106
816-57-9	12	1077-56-1	28	1403-66-3	90	2164-17-2	49
819-35-2	5	1116-54-7	3	1403-66-3	97	2185-92-4	48
827-16-7	34	1156-19-0	33	1403-66-3	110	2201-15-2	78
828-00-2	44	1163-19-5	22	1404-04-2	95	2210-79-9	26
833-43-2	31	1163-19-5	36	1404-04-2	97	2212-81-9	24
839-90-7	34	1163-19-5	43	1404-19-9	105	2219-30-9	63
842-00-2	58	1184-57-2	30	1406-05-9	108	2234-13-1	32
860-22-0	14	1189-85-1	25	1406-16-2	35	2244-16-8	42
865-21-4	108	1199-18-4	101	1415-93-6	120	2319-96-2	61
869-01-2	12	1212-29-9	48	1420-04-8	25	2373-98-0	27
877-31-6	12	1250-95-9	14	1456-28-6	2	2381-15-9	61
881-03-8	31	1260-17-9	25	1456-28-6	8	2381-16-0	61
911-45-5	56	1271-19-8	47	1456-28-6	17	2381-31-9	61
920-66-1	29	1277-43-6	25	1596-84-5	50	2381-39-7	61
924-16-3	3	1291-32-3	35	1606-67-3	54	2381-39-7	61
924-42-5	45	1295-35-8	24	1634-78-2	29	2381-39-7	61

CAS NUMBER INDEX

CAS	PAGE	CAS	PAGE	CAS	PAGE	CAS	PAGE
2385-85-5	45	3101-60-8	25	4368-28-9	108	6201-86-1	24
2404-44-6	28	3113-71-1	30	4396-27-4	31	6201-87-2	24
2421-02-5	34	3113-72-2	30	4460-86-0	39	6219-89-2	23
2422-79-9	61	3118-97-6	14	4460-86-0	50	6265-05-0	23
2425-79-8	40	3118-97-6	28	4460-86-0	68	6265-06-1	23
2425-85-6	43	3132-64-7	40	4553-62-2	30	6265-09-4	26
2426-08-6	25	3209-22-1	37	4635-87-4	32	6265-11-8	27
2429-74-5	43	3234-02-4	40	4685-14-7	83	6265-13-0	30
2432-99-7	48	3234-28-4	28	4759-48-2	68	6265-15-2	23
2438-88-2	33	3237-50-1	23	4901-51-3	33	6268-32-2	12
2438-88-2	38	3237-50-1	36	4914-30-1	26	6317-18-6	30
2438-88-2	50	3266-23-7	28	5076-20-0	28	6358-08-3	23
2451-62-9	34	3296-90-0	42	5090-36-8	100	6358-09-4	23
2461-15-6	28	3319-31-1	34	5124-30-1	30	6358-15-2	24
2461-18-9	29	3322-93-8	37	5131-58-8	31	6358-18-5	25
2475-45-8	44	3366-61-8	54	5142-23-4	60	6358-23-2	27
2489-77-2	39	3420-97-1	63	5160-02-1	51	6358-85-6	36
2489-77-2	50	3475-63-6	6	5307-14-2	31	6369-59-1	33
2493-84-7	32	3546-10-9	41	5314-33-0	2	6369-59-1	39
2498-75-1	61	3546-10-9	50	5314-33-0	17	6373-74-6	42
2498-76-2	61	3558-03-0	59	5392-40-5	43	6375-17-3	23
2498-77-3	61	3567-69-9	36	5392-40-5	67	6410-30-6	25
2498-77-3	61	3583-47-9	28	5397-31-9	28	6459-94-5	43
2498-77-3	61	3635-74-3	100	5432-28-0	4	6471-49-4	43
2528-36-1	26	3665-80-3	28	5437-38-7	30	6484-52-2	119
2541-69-7	61	3687-22-7	27	5466-84-2	31	6537-68-4	29
2567-01-3	32	3748-77-4	53	5470-11-1	29	6637-88-3	25
2610-10-8	14	3902-71-4	52	5493-45-8	26	6652-04-6	6
2610-10-8	16	4016-14-2	40	5522-43-0	31	6673-35-4	66
2624-17-1	33	4067-16-7	41	5522-43-0	63	6810-26-0	60
2675-77-6	25	4080-31-3	25	5522-43-0	63	6959-48-4	48
2698-41-1	43	4170-30-3	22	5536-17-4	93	7068-83-9	4
2757-90-6	23	4170-30-3	43	5536-17-4	93	7177-48-2	36
2783-94-0	28	4170-30-3	43	5536-17-4	93	7177-48-2	42
2784-94-3	59	4170-30-3	67	5611-51-8	113	7234-04-0	62
2835-95-2	23	4206-61-5	26	5634-39-9	45	7235-40-7	113
2836-00-2	23	4213-45-0	32	5660-60-6	25	7320-37-8	37
2855-19-8	28	4337-65-9	49	5850-81-7	25	7320-37-8	44
2871-01-4	44	4345-03-3	33	5850-90-8	25	7320-37-8	49
2941-64-2	28	4368-28-9	79	5926-90-9	29	7390-81-0	28
2958-98-7	62	4368-28-9	79	5989-27-5	38	7423-53-2	34
2958-98-7	62	4368-28-9	99	5989-27-5	45	7428-83-3	54
3018-12-0	37	4368-28-9	102	5989-27-5	49	7428-83-3	54
3039-13-2	26	4368-28-9	103	6041-94-7	25	7428-83-3	54
3054-95-3	2	4368-28-9	104	6098-44-8	54	7428-83-3	54
3054-95-3	17	4368-28-9	105	6111-78-0	61	7429-90-5	88
3077-12-1	14	4368-28-9	108	6112-76-1	65	7439-89-6	90
3083-23-6	37	4368-28-9	108	6112-76-1	65	7439-92-1	74

CAS NUMBER INDEX

CAS	PAGE	CAS	PAGE	CAS	PAGE	CAS	PAGE
7439-92-1	74	7516-82-7	4	9000-01-5	51	10326-27-9	48
7439-92-1	74	7631-86-9	83	9000-01-5	51	10589-74-9	12
7439-92-1	95	7631-86-9	83	9000-30-0	51	10595-95-6	4
7439-92-1	101	7631-90-5	21	9002-79-3	70	10595-95-6	7
7439-92-1	120	7632-00-0	9	9004-66-4	49	10595-95-6	7
7439-93-2	115	7632-00-0	11	9005-49-6	75	10595-95-6	7
7439-93-2	115	7647-01-0	81	9005-65-6	44	10595-95-6	7
7439-95-4	102	7647-14-5	33	9008-11-1	94	10595-95-6	7
7439-95-4	105	7647-14-5	38	9008-11-1	95	10599-90-3	42
7439-96-5	52	7664-41-7	98	9008-11-1	111	10599-90-3	119
7439-96-5	95	7664-41-7	98	9009-86-3	91	11012-59-2	15
7439-97-6	74	7664-93-9	121	9012-25-3	113	11012-59-2	16
7439-97-6	74	7665-72-7	25	10043-92-2	121	11023-79-4	94
7439-97-6	113	7673-09-8	34	12715-61-6	14	11024-24-1	26
7439-97-6	113	7681-49-4	46	10024-89-2	11	11041-12-6	14
7440-02-0	120	7681-49-4	50	10024-89-2	11	11041-12-6	16
7440-18-8	79	7681-49-4	113	10024-89-2	11	11054-70-9	101
7440-20-2	97	7683-59-2	65	10024-89-2	11	11056-06-7	80
7440-22-4	121	7683-59-2	65	10024-89-2	11	11056-06-7	80
7440-31-5	102	7683-59-2	94	10024-97-2	66	11056-06-7	80
7440-38-2	74	7695-91-2	66	10024-97-2	66	11056-06-7	80
7440-38-2	88	7705-08-0	49	10024-97-2	113	11077-03-5	105
7440-38-2	119	7722-84-1	111	10028-15-6	83	11097-69-1	24
7440-41-7	80	7722-84-1	111	10028-15-6	83	11097-69-1	55
7440-43-9	51	7722-84-1	111	10028-15-6	120	12001-85-3	15
7440-43-9	74	7722-84-1	113	10028-15-6	120	12035-77-3	45
7440-43-9	117	7725-93-1	29	10028-15-6	121	12070-12-1	47
7440-43-9	117	7732-18-5	35	10028-15-6	121	12083-48-6	24
7440-44-0	97	7757-93-9	113	10028-17-8	97	12433-50-0	33
7440-44-0	99	7772-99-8	50	10028-17-8	99	12715-61-6	16
7440-44-0	100	7778-50-9	32	10028-17-8	108	12778-32-4	98
7440-44-0	101	7782-44-7	78	10043-35-3	42	12789-03-6	36
7440-44-0	103	7782-44-7	82	10043-35-3	48	12789-03-6	48
7440-44-0	107	7782-44-7	82	10049-04-4	119	13007-92-6	14
7440-50-8	67	7782-44-7	82	10101-97-0	45	13007-92-6	25
7440-70-2	98	7782-44-7	82	10101-97-0	49	13007-92-6	36
7440-70-2	117	7782-49-2	52	10102-44-0	82	13042-18-7	28
7446-09-5	121	7782-50-5	81	10102-44-0	120	13073-35-3	89
7446-09-5	121	7783-20-2	119	10102-44-0	120	13114-72-2	30
7447-40-7	50	7784-46-5	76	10102-44-0	120	13256-07-0	5
7466-09-5	121	7787-56-6	24	10108-64-2	48	13256-11-6	5
7487-94-7	40	7990-92-3	119	10108-64-2	51	13284-42-9	32
7487-94-7	45	7990-92-3	119	10125-76-5	63	13345-63-6	60
7487-94-7	49	8001-79-4	42	10139-05-6	2	13366-73-9	38
7487-94-7	65	8003-22-3	26	10213-75-9	28	13463-39-3	31
7487-94-7	65	8022-00-2	30	10277-43-7	29	13463-67-7	33
7487-94-7	90	8022-00-2	102	10326-27-9	24	13463-67-7	38
7505-62-6	59	8065-48-3	100	10326-27-9	42	13463-67-7	50

CAS NUMBER INDEX

CAS	PAGE	CAS	PAGE	CAS	PAGE	CAS	PAGE
13506-76-8	30	15950-66-0	34	22967-92-6	62	28538-70-7	18
13674-84-5	32	16110-13-7	60	22967-92-6	62	28767-61-5	33
13684-83-4	29	16169-16-7	63	22967-92-6	101	29671-57-6	28
13743-07-2	4	16277-49-9	12	23031-25-6	66	29964-84-9	29
13743-07-2	12	16338-99-1	5	23214-92-8	65	29984-33-6	93
13743-07-2	17	16423-68-0	94	23214-92-8	65	30310-80-6	11
13755-38-9	78	16596-41-1	2	23214-92-8	80	30392-41-7	65
13765-19-0	36	16830-14-1	12	23214-92-8	86	30651-40-2	54
13765-19-0	48	16984-48-8	113	23214-92-8	104	30651-40-2	59
13838-16-9	89	17341-25-2	104	23214-92-8	109	30999-33-8	101
13961-86-9	32	17341-25-2	105	23214-92-8	109	31368-48-6	19
13961-86-9	46	17557-23-2	31	23255-93-8	29	31551-45-8	27
13961-86-9	50	17660-46-7	59	23355-64-8	14	31551-45-8	37
13983-17-0	47	17700-09-3	34	23355-64-8	16	32986-56-4	92
14097-03-1	14	17804-35-2	24	23488-38-2	33	32986-56-4	97
14097-03-1	16	17901-16-5	26	23564-05-8	33	32986-56-4	112
14490-86-9	59	17924-92-4	52	23826-72-4	57	32986-56-4	112
14797-65-0	9	17924-92-4	52	24072-75-1	26	33229-34-4	49
14797-65-0	9	18168-01-9	28	24309-36-2	58	34197-98-3	31
14797-65-0	9	18708-70-8	34	24370-25-0	24	34423-54-6	5
14797-65-0	9	18774-85-1	12	24382-04-5	38	34913-07-0	32
14797-65-0	9	18883-66-4	91	24815-24-5	33	35471-49-9	32
14797-65-0	9	18883-66-4	91	25013-15-4	39	35523-89-8	104
14797-65-0	9	18883-66-4	91	25013-15-4	47	35523-89-8	104
14797-65-0	9	18883-66-4	91	25155-25-3	24	35523-89-8	106
14797-65-0	9	18883-66-4	96	25614-03-3	70	35523-89-8	106
14797-65-0	9	18968-99-5	102	25614-03-3	98	35523-89-8	107
14797-65-0	9	19315-64-1	60	25843-45-2	24	35554-08-6	101
14797-65-0	10	19315-64-1	60	25869-00-5	29	35631-27-7	2
14797-65-0	10	19530-88-2	58	25869-00-5	37	35631-27-7	5
14797-65-0	78	19686-73-8	24	25953-06-4	26	35631-27-7	12
14807-96-6	46	20537-88-6	84	25956-17-6	51	35631-27-7	18
14838-15-4	66	20830-81-3	65	26227-73-6	29	35631-27-7	18
14838-15-4	66	20830-81-3	65	26266-68-2	28	36355-01-8	46
14930-96-2	74	20830-81-3	86	26446-35-5	36	36355-01-8	69
14930-96-2	110	20830-81-3	87	26471-62-5	84	36791-04-5	93
15078-28-1	78	20830-81-3	87	26530-20-1	32	36791-04-5	93
15110-74-4	27	20830-81-3	110	26628-22-8	21	37187-49-8	100
15216-10-1	17	20917-49-1	4	26628-22-8	46	37187-49-8	100
15242-96-3	33	20917-49-1	8	26761-45-5	31	37187-49-8	100
15356-70-4	29	21247-98-3	60	27025-41-8	14	37203-43-3	21
15481-70-6	33	21473-40-5	58	27025-41-8	16	37203-43-3	52
15481-70-6	50	21711-65-9	63	27220-47-9	28	37209-28-2	98
15500-66-0	75	21739-91-3	26	27556-51-0	24	37209-28-2	98
15663-27-1	91	21829-25-4	31	28109-00-4	27	37209-28-2	98
15663-27-1	94	21829-25-4	78	28322-02-3	48	37209-28-2	98
15663-27-1	114	21838-75-5	26	28407-37-6	43	37209-28-2	98
15791-78-3	25	22967-92-6	52	28538-70-7	5	37209-28-2	104

CAS NUMBER INDEX

CAS	PAGE	CAS	PAGE	CAS	PAGE	CAS	PAGE
37209-28-2	104	55380-34-2	2	61789-36-4	14	70021-99-7	62
37517-30-9	65	55380-34-2	7	61789-51-3	14	70501-82-5	5
38304-91-5	66	55380-34-2	7	61790-14-5	15	71162-64-6	13
38347-74-9	5	55380-34-2	7	63041-76-9	61	71251-02-0	113
38347-74-9	18	55380-34-2	8	63041-76-9	61	71609-23-9	60
38416-55-2	62	55380-34-2	17	63041-77-0	61	71609-25-1	60
38848-76-9	27	55514-93-7	11	63041-77-0	61	71752-66-4	12
39156-41-7	26	55514-93-7	11	63041-77-0	62	71752-67-5	13
39377-38-3	65	55556-91-7	5	63041-90-7	62	71752-68-6	12
39377-38-3	65	55556-92-8	5	63041-90-7	62	71752-69-7	4
39461-53-5	64	55557-00-1	2	63041-90-7	62	71752-69-7	12
39817-09-9	30	55566-30-8	47	63104-32-5	61	71752-69-7	17
39884-52-1	5	55566-30-8	50	63104-32-5	61	71752-70-0	12
39884-52-1	18	55893-12-4	101	63104-32-5	61	72533-46-1	59
39884-53-2	2	56311-56-1	90	63166-73-4	19	73467-76-2	80
40548-68-3	5	56802-99-4	36	63449-39-8	43	73785-40-7	3
40709-29-3	105	56802-99-4	42	63449-39-8	43	73785-40-7	12
41479-14-5	44	57303-99-8	55	63449-39-8	56	74634-55-2	55
42135-22-8	31	57404-88-3	55	63449-39-8	56	74634-55-2	55
42135-22-8	38	57653-85-7	29	63585-09-1	93	74649-41-5	12
42397-64-8	58	57966-42-4	106	63585-09-1	93	74649-42-6	12
42397-65-9	58	58139-59-6	24	63585-09-1	93	75321-19-6	34
43003-87-8	58	59141-40-1	107	63975-21-3	59	75321-20-9	57
43625-65-6	108	59277-89-3	93	64158-97-0	12	75356-79-5	52
46061-25-0	6	59277-89-3	93	64532-97-4	32	75625-24-0	29
51785-99-0	19	59277-89-3	93	65445-59-2	2	75881-15-1	5
50285-70-6	6	59277-89-3	93	65445-60-5	2	75881-16-2	2
50438-75-0	14	59277-89-3	109	65445-61-6	2	75881-16-2	18
50700-49-7	54	59277-89-3	109	66104-23-2	71	75881-17-3	3
50851-28-0	26	59495-21-5	59	66240-02-6	12	75881-18-4	6
51110-01-1	107	59865-13-3	26	66267-19-4	57	75881-18-4	18
51110-01-1	107	59865-13-3	36	66267-19-4	57	75881-19-5	5
51285-72-8	17	59960-30-4	12	67176-33-4	59	75881-20-8	5
52551-67-4	38	60599-38-4	3	67242-54-0	13	75881-21-9	2
52551-67-4	44	60599-38-4	17	67774-31-6	2	78338-31-5	2
52663-84-0	64	60657-25-2	55	67846-32-6	29	78338-32-6	2
52665-69-7	52	60657-25-2	55	67990-32-3	34	80789-74-8	40
53404-18-5	32	60657-25-2	55	68426-45-9	12	82507-24-2	57
54150-69-5	27	60880-63-9	98	68603-42-9	43	82507-24-2	57
54150-69-5	37	60967-88-6	55	68603-42-9	48	82507-24-2	57
54150-69-5	48	60967-90-0	55	69091-15-2	2	EMTDP-49	25
54289-46-2	26	61034-40-0	3	69091-16-3	2	EMTDP-51	32
54400-59-8	53	61050-97-3	34	69112-98-7	12	EMTDP-56	32
54849-38-6	30	61132-15-8	99	69112-99-8	12	EMTDP-58	35
55090-44-3	4	61214-51-5	70	69113-00-4	12	EMTDP-59	28
55090-44-3	7	61499-28-3	4	69304-47-8	93	ENTDP-57	28
55090-44-3	8	61578-04-9	26	69304-47-8	93	METHYL-2B	30
55146-01-5	58	61703-05-7	25	69304-47-8	109		

Chemical Index by Study Type

ACUTE/CHRONIC TOXICITY

STUDY TYPE INDEX

CHEMICAL	CAS NO.	PAGE
ACYCLOVIR	59277-89-3	93
ADRIAMYCIN	23214-92-8	109
ANTHRA[1,9-CD]PYRAZOL-6(2H)ONE,5-[3-AMINO-PROPYL)AMINO]7,10-DIHYDROXY-2-[2-[2-HYDROXY ETHYL)AMINO]-ETHYL]-,HYDROCHLORIDE		19
ANTHRA[1,9-CD]PYRAZOL-6(2H)-ONE,7,10-DIHYDROXY-2[2-[2-HYDROXYETHYL)AMINO]-ETHYL]-5-[[2-(METHYL-AMINO)ETHYL]AMINO]		19
ARSENIC	7440-38-2	88
BENZENE SULFONAMIDE, 4-AMINON-(5(or 8)-CHLORO-2 QUINOXALINYL)-		19
4H-1-BENZOPYRAN-8-ACETIC ACID,4-OXO-2-PHENYL		19
BLEOMYCIN	11056-06-7	80
BROMOBENZENE	108-86-1	86
BROMOBENZENE	108-86-1	86
BROMOBENZENE	108-86-1	86
BROMOBENZENE	108-86-1	86
2-ALPHA-BROMOERGOCRIPTINE	25614-03-3	
P-BROMOPHENOL	106-41-2	86
BUTAMISOLE	54400-59-8	53
BV-ARA-U		93
BVDU (BROMOVINYLDEOXYURIDINE)	69304-47-8	93
CHLOROFORM	67-66-3	86
CLOFIBRATE	637-07-0	56
CLOMIPHENE CITRATE	50-41-9	71
COAL COMBUSTION PRODUCTS		117
COAL LIQUEFACTION MATERIALS		117
COAL LIQUEFACTION MATERIALS		117
COAL LIQUEFACTION MATERIALS		118
L-CYSTEINE, ETHYL ESTER, METHYL CARBAMATE (ESTER), METHYL CARBAMATE (ESTER), MONOHYDROCHLORIDE	51785-99-0	19
COMFREY ROOT, IMPORTED		51
DEOXYSPERGUALIN		19
DHPG		93
DHPG		93
1,2-DIBROMO-3-CHLOROPROPANE	96-12-8	21
DIHYDROTRIAZINE	31368-48-6	19
DIMETHOXYBENZIDINE	119-90-4	57
1,5,2,4-DIOXADITHIEPANE,2,2,4,4-TETRAOXIDE		19
DIOXINE		53
BETA-ENDORPHIN	61214-51-5	70
FIAC		93
FIAC		93
GENTIAN VIOLET	548-62-9	53
GENTIAN VIOLET	548-62-9	59
GLYCENE ESTER OF APHIDICOLIN		19
GUM ARABIC	9000-01-5	51
GUM TRAGACANTH		52

CHEMICAL	CAS NO.	PAGE
LINDANE	58-89-9	60
MANNITOL		52
ALPHA-MELANOCYTE STIMULATING HORMONE	9002-79-3	70
NICKEL COMPOUNDS		118
NITROFURANTOIN	67-20-9	82
P-NITROPHENOL	100-02-7	63
OCTENIDINE	71251-02-0	113
OLIVE OIL/RAPE SEED OIL		21
PANCRATIASTATIN		19
PARTICLES FROM OIL SHALE RETORTING		118
PENTACHLOROPHENOL		53
PENTACHLOROPHENOL	87-86-5	52
PERGOLIDE MESYLATE	66104-23-2	71
PESTICIDES		121
PHENYLALKYLAMINES		79
PHENYLPROPANOLAMINE	14838-15-4	66
PHOSPHONOFORMATE	63585-09-1	93
PHYLLANTHROSIDE	63166-73-4	19
2H-PYRAN-2-ONE, 5,6-DIHYDRO6-(3,6,13-TRIHYDOXY-3 METHYL-4-(PHOSPHONOXY)-1,7,9,-TRIDECATETRAENYL)-, MONOSODIUM SALT		19
PICLORAM		121
SACCHARIN	81-07-2	52
SACCHARIN	81-07-2	64
SORBITOL		52
SULFAMETHAZINE	57-68-1	53
SULFAMETHAZINE	57-68-1	64
TETROCARCIN A, SODIUM SALT		19
THENYLDIAMINE	91-79-2	64
TRIPHENYL PHOSPHATE	115-86-6	52
XYLITOL		52

ANALYTICAL CHEMISTRY

CHEMICAL	CAS NO.	PAGE
CADMIUM METALLOTHIONEN		51
3,3'-DICHLOROBENZIDINE	92-87-5	58
DIRECT RED 2	992-59-6	58
1-NITROPYRENE	5522-43-0	63
NITROSAMINE IN PACIFIERS: COMPLIANCE TESTING		63
NITROSAMINE IN PACIFIERS: COLLABORATION OF NCTR METHOD THROUGH AOAC		63

302<

BIOCHEMICAL/CELLULAR/TISSUE EFFECT

CHEMICAL	CAS NO.	PAGE
ACETALDEHYDE	75-07-0	76
ACETAMINOPHEN	103-90-2	54
ACETAMINOPHEN	103-90-2	88
ACETAMINOPHEN	103-90-2	109
N-ACETOXY-2-ACETYLAMINOFLUORENE	6098-44-8	54
(3H)-N-ACETYL-2-AMINOFLUORENE		54
N-ACETYL-P-BENZOQUINONEIMINE	50700-49-7	54
ACETYLCHOLINE	51-84-3	97
ACETYLCHOLINE	51-84-3	104
ACETYLCHOLINE	51-84-3	104
N-ACETYL-N-HYDROXY-2-AMINOFLUORENE	30651-40-2	54
ACROLEIN	107-02-8	80
ACROLEIN	107-02-8	80
ACRYLAMIDE	79-06-1	105
ACRYLONITRILE	107-13-1	88
ACRYLONITRILE	107-13-1	88
ACTINOMYCIN D	50-76-0	54
ACYCLOVIR	59277-89-3	93
ACYCLOVIR	59277-89-3	93
ACYCLOVIR (ACV)	59277-89-3	109
ACYCLOVIR (ACV)	59277-89-3	109
ADENINE ARABINOSIDE	5536-17-4	93
ADENINE NUCLEOTIDES		94
ADENINE NUCLEOTIDES		107
S-ADENOSYL-L-METHIONINE ANALOGS		93
ADRIAMYCIN	23214-92-8	80
ADRIAMYCIN	23214-92-8	86
AEROSOLS		80
AFLATOXIN	1402-68-2	51
AFLATOXIN (INACTIVATED)	1402-68-2	54
AIR POLLUTANTS		80
ALCOHOL	64-17-5	76
ALCOHOL	64-17-5	76
ALIPHATIC NITRILES		78
ALUMINUM	7429-90-5	88
AMIKACIN		109
(3H)4-AMINOBIPHENYL		54
5'-AMINO-5-IODO-2'-DEOXYURIDINE		109
BETA-AMINO-PROPRIONITRILE		109
AMMONIA	7664-41-7	98
AMMONIA	7664-41-7	98
ANESTHETICS		103
ANTIBIOTICS		78
ANTIBIOTICS, ADRIAMYCIN	23214-92-8	104
ANTICONVULSANTS		101
ANTICONVULSANTS		103
ANTIOXIDANTS		78
ARA-A	5536-17-4	93

CHEMICAL	CAS NO.	PAGE
ARABINOSYLTHYMINE		93
ASBESTOS	1332-21-4	80
ASCORBIC ACID	50-81-7	51
ASCORBIC ACID	50-81-7	55
ASPIRIN	50-78-2	86
6-AZAURACIL	461-89-2	94
BACTERIAL ENDOTOXIN		98
BARBITURATES		98
BENZAMIDINE DERIVATIVES		70
BENZOCTAMINE HCl		109
BENZO (A) PYRENE	73467-76-2	80
BENZO(A)PYRENE-TRANS-7,8-DIHYDRODIOL	57404-88-3	55
BENZO(A)PYRENE-TRANS-9,10-DIHYDRODIOL	74634-55-2	55
BENZO(A)PYRENE-TRANS-7,8-DIOL-ANTI-9,10-EPOXIDE		55
BERYLLIUM	7440-41-7	80
BILIRUBIN	635-65-4	86
BLEOMYCIN	11056-06-7	80
BLEOMYCIN		80
BLEOMYCIN	11056-06-7	80
BOILING POINT FRACTIONS OF COAL LIQUEFACTION PRODUCTS		117
BROMDEOXYURIDINE	59-14-3	109
BROMOBENZENE	108-86-1	86
BROMOBENZENE	108-86-1	86
BROMOBENZENE	108-86-1	86
BROMOBENZENE	108-86-1	86
2-ALPHA-BROMOERGOCRIPTINE	25614-03-3	70
P-BROMOPHENOL	106-41-2	86
5-(2-BROMOVINYL)-2'-DEOXYURIDINE	69304-47-8	109
BUNGAROTOXIN	37209-28-2	98
BUNGAROTOXIN	37209-28-2	98
BUNGAROTOXIN	37209-28-2	104
BUNGAROTOXIN	37209-28-2	104
T-BUTYLATED HYDROXY-ANISOL (BHA)		109
T-BUTYLATED HYDROXYTOLUENE (BHT)	128-37-0	109
BVDU (BROMOVINYLDEOXYURIDINE)	69304-47-8	93
CADMIUM CHLORIDE	10108-64-2	51
CADMIUM SULFIDE		110
CAFFEINE	58-08-2	51
CAFFEINE	58-08-2	76
CAFFEINE	58-08-2	99
CALCIUM	7440-20-2	97
CANNABINOL		76
CARBON	7440-44-0	100
CARBON	7440-44-0	101
CARBON		105
CARBON	7440-44-0	107
CARBON TETRACHLORIDE	56-23-5	88

STUDY TYPE INDEX

BIOCHEMICAL/CELLULAR/TISSUE EFFECT

CHEMICAL	CAS NO.	PAGE
CARBON TETRACHLORIDE	56-23-5	119
BETA-CAROTENE	7235-40-7	113
CATECHOLAMINES		102
CEFAZOLIN		119
CF3DURD		93
CHLORCYCLIZINE	82-93-9	80
CHLORIMIPRAMINE	303-49-1	81
CHLORINE GAS	7782-50-5	81
CHLOROFORM	67-66-3	86
CHLORPHENTERMINE	461-78-9	81
CHLORPROMAZINE	50-53-3	88
CHLORPROMAZINE	50-53-3	81
CHLORPROMAZINE	50-53-3	99
CHOLERA TOXIN		99
CHOLERA TOXIN ADENINE NUCLEOTIDES		94
CHOLESTEROL OXIDES		51
CHRYSENE-TRANS-3,4-DIHYDRODIOL		56
CITRININ	518-75-2	51
CLOFIBRATE	637-07-0	56
CLOMID		70
CLOMIPHENE CITRATE	50-41-9	71
COAL GASIFICATION MATERIALS		117
COFFEE DUST		81
COMBUSTION FLY ASH		118
CONTRACEPTIVE ESTROGENS AND PROGESTINS		73
CONTRACEPTIVE ESTROGENS AND PROGESTINS		73
CORTICOSTEROIDS		81
COTTON DUST		81
COTTON DUST		81
CYCLIZINE	82-92-8	81
CYCLOPHOSPHAMIDE	50-18-0	74
CYCLOPHOSPHAMIDE (TOXIC METABOLITES)	50-18-0	81
CYSTEAMINE	60-23-1	77
CYSTEAMINE	60-23-1	89
CYSTEAMINE	60-23-1	89
CYTOCHALASIN	37187-49-8	100
CYTOCHALASIN	37187-49-8	100
CYTOCHALASIN D	14930-96-2	74
DAUNOMYCIN	20830-81-3	86
DAUNORUBICIN	20830-81-3	87
DAUNORUBICIN	20830-81-3	87
DAUNORUBICIN	20830-81-3	110
DEANOL ACETAMIDOBENZOATE	3635-74-3	100
DEAZUPURINE ANALOGS		93
DECOYININE	2004-04-8	94
DEMETHYLCHLORTETRACYCLINE	127-33-3	89
4-(DEOXYADENOSIN-6-YL)4-AMINOBIPHENYL		56
4-(DEOXYADENOSIN-6-YL)-2-NAPHTHYLAMINE		56

CHEMICAL	CAS NO.	PAGE
3-(DEOXYGUANOSINE-N2-YL)-2-ACETYLAMINOFLUORENE		56
N-(DEOXYGUANOSINE-8-YL)-2-ACETYLAMINOFLUORENE		56
N-(DEOXYGUANOSINE-8-YL)-4-AMINOBIPHENYL		56
N-(DEOXYGUANOSINE-8-YL)-2-AMINOFLUORENE		56
DEXAMETHASONE	50-02-2	57
DHPG		93
DHPG		93
DIBENZ(A)ANTHRACENE-TRANS-3,4-DIHYDRODIOL	66267-19-4	57
DIBROMOCHLOROPROPANE	96-12-8	89
DICALCIUM PHOSPHATE DIHYDRATE	7757-93-9	113
DIETHYLSTILBESTROL	56-53-1	57
DIETHYLSTILBESTROL	56-53-1	70
DIETHYLSTILBESTROL	56-53-1	70
N,N-DIETHYL-M-TOLUAMIDE	134-62-3	67
DILANTIN	57-41-0	76
DIMETHYLNITROSAMINE	62-75-9	89
DIOXINE		53
DIPYRIDAMOLE	58-32-2	100
DOPAMINE	51-61-6	89
DOPAMINE	51-61-6	101
BETA-ENDORPHIN	61214-51-5	70
ENFLUREANE	13838-16-9	89
EPICHLOROHYDRIN	106-89-8	89
ERYTHROSIN B	16423-68-0	94
ESTRADIOL	50-28-2	58
ETHACRYNIC ACID	58-54-8	101
ETHIONINE	13073-35-3	89
ETHOSUXIMIDE	77-67-8	94
3-ETHYLADENINE	43003-87-8	58
7-ETHYLADENINE	24309-36-2	58
O2-ETHYLCYTOSINE		58
1-ETHYLDEOXYADENOSINE		58
N6-ETHYLDEOXYADENOSINE		58
3-ETHYLDEOXYCYTIDINE		58
N4-ETHYLDEOXYCYTIDINE		58
1-ETHYLDEOXYGUANOSINE		58
N2-ETHYLDEOXYGUANOSINE		58
O6-ETHYLDEOXYGUANOSINE		58
ETHYLENE DIBROMIDE	106-93-4	89
3-ETHYLGUANINE	55146-01-5	58
7-ETHYLGUANINE	19530-88-2	58
ETHYL METHANESULFONATE	62-50-0	58
ETHYLNITROSOUREA	759-73-9	58
4-ETHYLSULFONYLNAPHTHALENE-1-SULFONAMIDE	842-00-2	58
3-ETHYLTHYMIDINE	21473-40-5	58
O2-ETHYLTHYMIDINE	59495-21-5	59
O4-ETHYLTHYMIDINE		59
ETHYLTHYMIDYL(3'-5')DEOXYADENOSINE		59

STUDY TYPE INDEX

BIOCHEMICAL/CELLULAR/TISSUE EFFECT

CHEMICAL	CAS NO.	PAGE
ETHYLTHYMIDYL(3'-5')DEOXYCYTIDINE		59
TRANS FATTY ACIDS		51
FIAC		93
FIAC		93
8-(N-FLUOREN-2-YLACETAMIDO)-2'-DEOXYGUANOSINE 5'-MONO PHOSPHATE	14490-86-9	59
8-(N-FLUOREN-2-YLAMINO)-2'DEOXYGUANOSINE 5'-MONO PHOSPHATE	17660-46-7	59
FLUORESCEINS		94
5-FLUOROURACIL	51-21-8	110
5-FLUOROURACIL	51-21-8	110
FORMALDEHYDE	50-00-0	113
N-FORMYL-N-HYDROXY-2-AMINOFLUOENE	67176-33-4	59
FURAZOLIDONE		87
FUROSEMIDE	54-31-9	87
FUROSEMIDE	54-31-9	87
GENTAMICIN	1403-66-3	90
GENTAMICIN	1403-66-3	110
GONADATROPIC RELEASING HORMONE ANALOGS		70
GONADOTROPIC RELEASING HORMONE ANALOGS		70
GONADOTROPIC RELEASING HORMONE ANALOGS		70
HADACIDIN	689-13-4	94
HALOALKYLAMINES		95
HALOCARBONS		87
HALOGENS HALOHYDROCARBONS		87
HALOPERIDOL	52-86-8	106
HALOTHANE	151-67-7	87
HALOTHANE	151-67-7	101
HEAVY METALS ON PARTICLES		118
HEMATOPORPHYRIN		110
HEPARIN		85
HEPARIN-DERIVED ANTICOAGULANTS		85
HISTAMINE	51-45-6	101
HYDROGEN PEROXIDE	7722-84-1	111
HYDROGEN PEROXIDE	7722-84-1	111
HYDROGEN PEROXIDE	7722-84-1	111
HYDROTREATED COAL LIQUEFACTION PRODUCTS		118
3-HYDROXYACETANILIDE	621-42-1	90
N-HYDROXY-2-ACETYLAMINOFLUORENE	53-95-2	59
N-HYDROXY-2-ACETYLAMINOFLUORENE	53-95-2	59
N-HYDROXY-N-ACETYL-2-AMINOFLUORENE	30651-40-2	59
N-HYDROXY-2-AMINOFLUORENE	53-94-1	60
N-HYDROXY-1-AMINOPYRENE		60
HYDROXYL RADICAL		111
HYDROXYL RADICAL		111
N-HYDROXY-2-NAPHTHYLAMINE	613-47-8	60
CIS-HYDROXYPROLINE		111
IDURD		93

CHEMICAL	CAS NO.	PAGE
IMIDAZOLES		82
IMIPRAMINE	50-49-7	82
INSECTICIDES		117
IRON	7439-89-6	90
ISONIAZID	54-85-3	90
ISOPROTERENOL	7683-59-2	94
ISOQUINOLINES AND RELATED ANALOGS		93
KAINATE		111
KAOLIN	1332-58-7	82
KAOLIN	1332-58-7	82
KEPONE	143-50-0	21
LEVODOPA	59-92-7	90
LIDOCAINE	137-58-6	78
LINDANE	58-89-9	60
LYMPHOKINES		82
MAGNESIUM PEMOLINE	18968-99-5	102
ALPHA-MELANOCYTE STIMULATING HORMONE	9002-79-3	70
MERCURIC CHLORIDE	7487-94-7	90
5-METHOXYPSORALEN	484-20-8	52
7-METHYLBENZO(A)PYRENE-TRANS-7-,8-DIHYDRODIOL		61
7-METHYLBENZO(A)PYRENE-TRANS-7-,8-DIHYDRODIOL-ANTI-9,10-EPOXIDE		61
METHYLCHOLANTHRENE	56-49-5	90
METHYL METHANESULFONATE	66-27-3	62
METHYLPHENIDATE	113-45-1	102
METKEPHAMID		71
MONOCROTALINE		82
MORPHINE	57-27-2	102
MOXESTROL	38416-55-2	62
MUTAGENIC AGENTS		71
MYCOTOXINS		100
NETILMICIN	56311-56-1	90
NEUROPHARMACOLOGICAL AGENTS		108
NEUROTOXINS		95
NEUROTOXINS		95
NEUROTOXINS		97
NEUROTOXINS		97
NEUROTOXINS		101
NEUROTOXINS		103
NEUROTOXINS		103
NEUROTOXINS		104
NEUROTOXINS		104
NEUROTOXINS		104
NEUROTOXINS		105
NEUROTOXINS		108
NICOTINE	54-11-5	76
NITRITE	14797-65-0	78
NITROFURANTOIN	67-20-9	82

CHEMICAL	CAS NO.	PAGE
NITROGEN DIOXIDE	10102-44-0	82
NITROGEN DIOXIDE	10102-44-0	120
NITROGLYCERIN	55-63-0	105
NITROPRUSSIDE	13755-38-9	78
NOREPINEPHRINE	51-41-2	99
NOREPINEPHRINE	51-41-2	105
OCHRATOXIN A	303-47-9	90
OXIDANTS		78
OXIDANTS		82
OXYGEN	7782-44-7	82
OXYGEN	7782-44-7	82
OXYGEN	7782-44-7	82
OXYGEN	7782-44-7	78
OXYGENMETABOLITES		85
OZONE	10028-15-6	83
OZONE	0028-15-6	83
OZONE	0028-15-6	83
OZONE	10028-15-6	120
OZONE	10028-15-6	121
PARAOXON	311-45-5	63
PARAOXON	311-45-5	63
PARAQUAT	4685-14-7	83
PENICILLAMINE	52-67-5	111
D-PENICILLAMINE	52-67-5	112
PENTACHLOROPHENOL		53
PERGOLIDE MESYLATE	66104-23-2	71
PEROXIDASES		79
PEROXIDES		83
PETROXIDASES		83
PHENOBARBITAL	50-06-6	103
PHENOBARBITAL	50-06-6	90
PHENOTHIAZINES		83
PHENTERMINE	122-09-8	83
PHENYLALKYLAMINES		94
PHORBOL ESTERS		91
PHOSPHONOFORMATE	63585-09-1	93
PHOSPHONOFORMATE	63585-09-1	93
PHOSPHOPROTEIN PHOSPHATASES		106
PHOSPHORAMIDE		83
PHYSOSTIGMINE	57-47-6	106
PILOCARPINE	92-13-7	83
ANTI-PLATELET DRUGS		106
CIS-PLATINUM	15663-27-1	91
PLATINUM (COMPOUNDS)		91
PROBENECID	57-66-9	95
PROPANOL	71-23-8	106
PROSTAGLANDIN E1	745-65-3	106
PSORALEN	66-97-7	52

CHEMICAL	CAS NO.	PAGE
PUROMYCIN	53-79-2	83
PYRIMIDINES		99
QUINEBIDIMYL BENZILATE		106
QUINIDINE	56-54-2	79
QUINIDINE	56-54-2	95
QUINOLINES		104
RESPIRATORY SYSTEM TOXINS		83
RIBAVIRIN	36791-04-5	93
RIBAVIRIN	36791-04-5	93
RUTHENIUM	7440-18-8	79
RUTHENIUM COORDINATION COMPLEXES		79
SACCHARIN	81-07-2	64
SACCHARIN	81-07-2	64
SAXITOXIN	35523-89-8	104
SCOPOLAMINE	51-34-3	107
SELENIUM	7782-49-2	52
SEROTONIN	50-67-9	107
SILICA	7631-86-9	83
SILICA	7631-86-9	83
SNAKE VENOM PROTEASES		85
SODIUM ARSENITE	7784-46-5	76
SOMATOSTATIN	51110-01-1	107
SOUTHERN COPPERHEAD VENOM		85
STREPTOMYCIN	57-92-1	112
STREPTOXOTOCIN	18883-66-4	91
STREPTOZOCIN	18883-66-4	96
STREPTOZOTOCIN	18883-66-4	91
STREPTOZOTOCIN	18883-66-4	91
STREPTOZOTOCIN	18883-66-4	91
N2-SUBSTITUTED GUANINES		93
SUCCINIMIDES		91
SULFANILAMIDE	63-74-1	91
SULFAPYRAZINE	116-44-9	108
SULFUR DIOXIDE	7446-09-5	121
SULFURIC ACID	7664-93-9	121
SUPEROXIDE ANION		112
SUPEROXIDE ANION		112
SUPEROXIDE RADICAL		112
TERATOGENIC AGENTS		96
TESTOSTERONE	58-22-0	64
TETRODOTOXIN	4368-28-9	99
TETRODOTOXIN	4368-28-9	102
TETRODOTOXIN	4368-28-9	105
TETRODOTOXIN	4368-28-9	108
THIOACETAMIDE	62-55-5	92
THIOCYANATE	302-04-5	76
TOBACCO		71
TOBACCO SMOKE		79

CHEMICAL	CAS NO.	PAGE
TOBACCO SMOKE		83
TOBRAMYCIN	32986-56-4	97
TOBRAMYCIN	32986-56-4	112
TOBRAMYCIN	32986-56-4	112
TOLUENE DIISOCYANATE	26471-62-5	84
TOXALBUMINS		84
TOXIN B (CHLOSTRIDIUM		92
TRIAMCINOLONE		112
TRIFLUOROTHYMIDINE	70-00-8	112
TRIMETHYL-PSORALEN	3902-71-4	52
VARIANT III SCORPION TOXIN		113
VENOM		105
VENOMS		97
VENOMS		105
VIDARABINE (ARA-A)		112
VITAMIN A	68-26-8	113
VITAMIN E		52
VOMITOXIN	17924-92-4	52
WR 2721	20537-88-6	84
ZEARALENONE	17924-92-4	52

307<

STUDY TYPE INDEX

CARCINOGENESIS

CHEMICAL	CAS NO.	PAGE
ACETALDOXIME	107-29-9	2
ACETONITRILE	75-05-8	42
N-ACETOXY-AMINOFLUORENE		54
2-ACETYLAMINOFLUORENE	53-96-3	54
2-ACETYLAMINOFLUORENE	53-96-3	54
2-ACETYLAMINOFLUORENE	53-96-3	54
N-ACETYL-2-AMINOFLUORENE	53-96-3	54
N-ACETYLBENZIDINE	3366-61-8	54
ACID ORANGE NO. 3	6373-74-6	42
ACRALDEHYDE DIETHYLACETAL	3054-95-3	2
ACRALDEHYDE OXIME	5314-33-0	2
ACROLEIN	107-02-8	2
ACROLEIN DIETHYLACETAL	3054-95-3	17
ACROLEIN OXIME	5314-33-0	17
ACRYLONITRILE	107-13-1	20
ALLANTOIN	97-59-6	9
ALLANTOIN	97-59-6	9
ALLYL ALCOHOL	107-18-6	17
ALLYL ALCOHOL	107-18-6	2
ALLYL GLYCIDYL ETHER	106-92-3	42
9-AMINOACRIDINE HYDROCHLORIDE	134-50-9	42
6-AMINOBENZO(A)PYRENE	7428-83-3	54
1-AMINO-2,4-DIBROMOANTHRAQUINONE	81-49-2	42
2-AMINOFLUORENE	153-78-6	54
2-AMINO-4-NITROPHENOL	99-57-0	42
2-AMINO-5-NITROPHENOL	121-88-0	42
N-AMINOPROLINE	10139-05-6	2
N-AMINOPYRROLIDINE	16596-41-1	2
DL-AMPHETAMINE SULFATE	60-13-9	42
AMPICILLIN TRIHYDRATE	7177-48-2	42
AROCHLOR 1254	11097-69-1	55
ARSENIC	7440-38-2	119
ASBESTOS	1332-21-4	119
ASPHALTIC BASED PAINTS		119
AZODICARBONAMIDE	123-77-3	42
AZOXYETHANE		17
AZOXYMETHANE		17
BARIUM CHLORIDE DIHYDRATE	10326-27-9	42
BENZALDEHYDE	100-52-7	42
BENZANTHRACENE	56-55-3	55
BENZETHONIUM CHLORIDE	121-54-0	42
BENZOFURAN	271-89-6	42
BENZONITRILE	100-47-0	42
BENZO(A)PYRENE	50-32-8	88
BENZO(A)PYRENE	50-32-8	55
BENZO(A)PYRENE-CIS-7,8-DIHYDRODIOL	60657-25-2	55
BENZO(F)-QUINOLINE	85-02-9	42
BENZOYL CHLORIDE	98-88-4	42
BENZYL ACETATE	140-11-4	42
BENZYL ALCOHOL	100-51-6	42
BENZYL CHLORIDE	100-44-7	42
O-BENZYL-P-CHLOROPHENOL	120-32-1	42
1-BENZYL-1,3-DIMETHYLTRIAZENE	74649-41-5	12
1-BENZYL-3,3-DIMETHYLTRIAZENE	74649-42-6	12
2,2-BIS(BROMOMETHYL)-1,3-PROPANEDIOL	3296-90-0	42
BOILING POINT FRACTIONS OF COAL LIQUEFACTION PRODUCTS		117
BORIC ACID	10043-35-3	42
BROMOBENZENE	108-86-1	42
BROMOBENZENE	108-86-1	42
BROMODICHLOROMETHANE	75-27-4	42
2-BROMO-DMBA		12
3-BROMO-DMBA		12
4-BROMO-DMBA		12
BROMOFORM	75-25-2	42
1,3-BUTADIENE	106-99-0	42
2-BUTANONE PEROXIDE	1338-23-4	42
T-BUTYL ALCOHOL	75-65-0	42
BUTYL BENZYL PHTHALATE	85-68-7	42
N-BUTYL CHLORIDE	109-69-3	42
4-TERTIARY-BUTYL-NITROSOPIPERIDINE	46061-25-0	6
TERT-BUTYL PERBENZOATE	614-45-9	42
BUTYRALDEHYDE	123-72-8	42
BUTYRALDEHYDE	123-72-8	42
GAMMA-BUTYROLACTONE	96-48-0	42
CARBON TETRACHLORIDE	56-23-5	119
CARBON TETRACHLORIDE	56-23-0	119
CARISOPRODOL	78-44-4	42
D-CARVONE	2244-16-8	42
CASTOR OIL	8001-79-4	42
CHLORAMINE	10599-90-3	42
CHLORDIAZEPOXIDE	58-25-3	9
CHLORENDIC ACID	115-28-6	42
CHLORINATED TRISODIUM PHOSPHATE	56802-99-4	42
CHLORINATION BI-PRODUCTS		119
CHLORINE (CHLORINATED DRINKING WATER)	7990-92-3	119
CHLOROACETOPHENONE	532-27-4	43
P-CHLOROANILINE	106-47-8	43
O-CHLOROBENZALMALONITRILE	2698-41-1	43
3-CHLORO-2-METHYLPROPENE	563-47-3	43
4-CHLORO-2-NITROANILINE	89-63-4	43
3-CHLORONITROSOPIPERIDINE	65445-60-5	2
4-CHLORONITROSOPIPERIDINE	65445-61-6	2
CHLOROTHEN	148-65-2	9
CHLOROWAX 40	63449-39-8	43
CHLOROWAX 500C	63449-39-8	43

CHEMICAL	CAS NO.	PAGE
CHLORPHENIRAMINE MALEATE	113-92-8	9
CHLORPHENIRAMINE MALEATE	113-92-8	9
CHLORPHENIRAMINE MALEATE	113-92-8	43
C.I. ACID RED 114	6459-94-5	43
C.I. BASIC RED 9	569-61-9	43
C.I. DIRECT BLUE 15	2429-74-5	43
C.I. DIRECT BLUE 218	28407-37-6	43
C.I. DIRECT YELLOW 11	1325-37-7	43
C.I. PIGMENT RED 3	2425-85-6	43
C.I. PIGMENT RED 23	6471-49-4	43
CITRAL	5392-40-5	43
CLOFIBRATE	637-07-0	56
COAGULANTS, COAGULANT AIDS		119
COAL COMBUSTION PRODUCTS		117
COAL GASIFICATION MATERIALS		117
COAL LIQUEFACTION MATERIALS		117
COAL TAR		120
COCONUT OIL ACID (2 PARTS)-DIETHANOLAMINE (1 PART)	68603-42-9	43
CODEINE	76-57-3	43
CONTRACEPTIVE ESTROGENS AND PROGESTINS		73
COUMARIN	91-64-5	43
CROTONALDEHYDE	4170-30-3	43
CROTONALDEHYDE	4170-30-3	43
CYCLOHEXANONE	108-94-1	43
4-CYCLOHEXYLNITROSOPIPERIDINE	75881-21-9	2
DECABROMODIPHENYL OXIDE	1163-19-5	43
3-DEUTERO-6-AMINOBENZO(A)PYRENE		56
3-DEUTERO-6-METHYLBENZO(A)PYRENE		56
DEUTERO-6-NITROBENZO(A)PYRENE		57
DEXAMETHASONE	50-02-2	57
N,N-DIACETYL-4-AMINOBENZO(A)PYRENE	82507-24-2	57
2,4-DIAMINOPHENOL DIHYDROCHLORIDE	137-09-7	43
4,4'-DIAMINO-2,2'-STILBENEDISULFONIC ACID	81-11-8	43
2,3-DIBROMO-1-PROPANOL	96-13-9	43
P-DICHLOROBENZENE	106-46-7	43
1,2-DICHLOROETHANE	107-06-3	67
2,4-DICHLOROPHENOL	120-83-2	43
DICHLORVOS	62-73-7	43
DIESEL FUEL MARINE		43
DIETHANOLAMINE	111-42-2	43
DIETHYLNITROSAMINE	55-18-5	2
DIETHYLNITROSAMINE-F6		2
DIETHYLNITROSOMETHYLUREA		8
DIETHYLNITROSOMETHYLUREA		2
DIETHYLNITROSOMETHYL-D3-UREA		2
DIETHYL PHTHALATE	84-66-2	43
3,4-DIHYDROCOUMARIN	119-84-6	43
1,2-DIHYDRO-2,2,4-TRIMETHYLQUINOLINE	147-47-7	43

CHEMICAL	CAS NO.	PAGE
DIMETHOXANE	828-00-2	44
3,3'-DIMETHOXYBENZIDINE	119-90-4	44
N,N-DIMETHYLANILINE	121-69-7	44
DIMETHYLBENZANTHRACENE	57-97-6	57
DIMETHYLBENZANTHRACENE	57-97-6	57
DIMETHYLBENZANTHRACENE	57-97-6	113
7,12-DIMETHYLBENZ(A)ANTHRACENE	57-97-6	57
3,3'-DIMETHYLBENZIDINE	119-93-7	57
3,3'-DIMETHYLBENZIDINE	119-93-7	44
DIMETHYLDINITROSOPIPERAZINE	55380-34-2	7
DIMETHYLDINITROSOPIPERAZINE	55380-34-2	7
2,6-DIMETHYLDINITROSOPIPERAZINE	55380-34-2	2
2,6-DIMETHYLDINITROSOPIPERAZINE	55380-34-2	17
2,6-DIMETHYLDINITROSOPIPERAZINE	55380-34-2	8
2,6-DIMETHYLDINITROSOPIPERAZINE-D4		2
DIMETHYLDODECYLAMINE OXIDE	1643-20-5	9
DIMETHYLDODECYLAMINE OXIDE	1643-20-5	9
DIMETHYLFORMAMIDE	68-12-2	67
DIMETHYL METHYLPHOSPHONATE	756-79-6	44
DIMETHYL MORPHOLINOPHOSPHORAMIDATE	597-25-1	44
2,6-DIMETHYLNITROSOMORPHOLINE	1456-28-6	2
2,6-DIMETHYLNITROSOMORPHOLINE	1456-28-6	8
2,6-DIMETHYLNITROSOMORPHOLINE	1456-28-6	17
2,6-DIMETHYLNITROSOMORPHOLINE-D2		2
2,6-DIMETHYLNITROSOMORPHOLINE-D4		2
2,6-DIMETHYLNITROSOMORPHOLINE-ISOMER A	69091-15-2	2
2,6-DIMETHYLNITROSOMORPHOLINE-ISOMER C	69091-16-3	2
2,6-DIMETHYL-4-NITROSOPIPERAZINE	67774-31-6	2
3,5-DIMETHYLNITROSOPIPERIDINE	65445-59-2	2
3,5-DIMETHYLNITROSOPIPERIDINE-ISOMER A	78338-31-5	2
3,5-DIMETHYLNITROSOPIPERIDINE-ISOMER B	78338-32-6	2
DIMETHYLOLDIHYDROXYETHYLENEUREA	1854-26-8	44
DIMETHYL PHTHALATE	131-11-3	44
DIMETHYLVINYL CHLORIDE	513-37-1	44
DINITROPYRENE		57
DINITROSOHOMOPIPERAZINE	55557-00-1	2
DIPHENHYDRAMINE HYDROCHLORIDE	147-24-0	9
DIPHENHYDRAMINE HYDROCHLORIDE	147-24-0	44
DIPHENHYDRAMINE HYDROCHLORIDE	147-24-0	9
DIPHENYLHYDANTOIN	57-41-0	44
DIPHENYLHYDANTOIN	57-41-0	58
DISPERSE BLUE NO. 1	2475-45-8	44
DISULFIRAM	97-77-8	9
DMBA/TPA/BPO (7,12-DIETHYLBENZ(A)ANTH	57-97-6	44
DOXYLAMINE	469-21-6	58
DRINKING WATER CONTAMINANTS		120
EPHEDRINE SULFATE	134-72-5	44
EPINEPHRINE HYDROCHLORIDE	55-31-2	44

STUDY TYPE INDEX

CARCINOGENESIS

CHEMICAL	CAS NO.	PAGE
1,2-EPOXYBUTANE	106-88-7	44
1,2-EPOXYHEXADECANE	7320-37-8	44
3,4-EPOXYNITROSOPIPERIDINE		2
ERYTHROMYCIN STEARATE	643-22-1	44
ESTRADIOL	50-28-2	58
ETHYLAZOXYETHANE		2
ETHYLAZOXYMETHANE		2
ETHYL BROMIDE	74-96-4	44
ETHYL CHLORIDE	75-00-3	44
ETHYLENE GLYCOL	107-21-1	44
ETHYLENE GLYCOL MONOETHYL ETHER	110-80-5	44
ETHYLENE OXIDE	75-21-8	44
ETHYLENE THIOUREA	96-45-7	44
ETHYL METHANESULFONATE	62-50-0	58
FLUORENES		90
6-FLUOROBENZO(A)PYRENE		90
FOUNDRY EFFLUENTS		67
FOUNDRY PARTICULATES		67
FURAN	110-00-9	44
FURFURAL	98-01-1	44
FUROSEMIDE	54-31-9	44
GENTIAN VIOLET	548-62-9	59
GLUTARALDEHYDE	111-30-8	44
GLYCIDOL	556-52-5	44
GLYCOL(POLYSORBATE 80)	9005-65-6	44
HALOACETONITRILES		120
HALOGENATED ACETONITRILES		120
HALOGENATED ETHANES		120
HC RED 3	2871-01-4	44
HC YELLOW 4	52551-67-4	44
HEXACHLORO-1,3-BUTADIENE	87-68-3	44
HEXACHLOROCYCLOPENTADIENE	77-47-4	44
HEXACHLOROETHANE	67-72-1	44
1,6-HEXANEDIAMINE	124-09-4	44
HEXYLRESORCINOL	136-77-6	44
HUMIC ACID	1415-93-6	120
HYDROCHLOROTHIAZIDE	58-93-5	9
HYDROCHLOROTHIAZIDE	58-93-5	9
HYDROCHLOROTHIAZIDE	58-93-5	44
HYDROQUINONE	123-31-9	44
4-HYDROXYACETANILIDE	103-90-2	45
N-HYDROXY-N-ACETYL-2-AMINOFLUORENE		59
N'-HYDROXY-N-ACETYLBENZIDINE	71609-23-9	60
N-HYDROXY-N-ACETYLBENZIDINE	71609-25-1	60
N-HYDROXY-4-AMINOBIPHENYL	6810-26-0	60
N-HYDROXY-AMINOFLUORENE	53-94-1	60
N-HYDROXY-N-FORMYL-2-AMINOFLUORENE		60
2-HYDROXY-4-METHOXYBENZOPHENONE	131-57-7	45

CHEMICAL	CAS NO.	PAGE
2-HYDROXY-4-METHOXYBENZOPHENONE	131-57-7	45
N-HYDROXY-1-NAPHTHYLAMINE	607-30-7	60
N-HYDROXY-1-NAPHTHYLAMINE	607-30-7	60
N-HYDROXY-2-NAPHTHYLAMINE	613-47-8	60
N-HYDROXY-2-NAPHTHYLAMINE	613-47-8	60
INSECTICIDES		117
IODINATED GLYCEROL	5634-39-9	45
ISOBUTYL NITRITE	542-56-3	45
ISOBUTYRALDEHYDE	78-84-2	45
ISOPHORONE	78-59-1	45
ISOPRENE	78-79-5	45
LAURIC ACID DIETHANOLAMINE	120-40-1	45
D-LIMONENE	5989-27-5	45
MALONALDEHYDE	542-78-9	45
2-MERCAPTOBENZIMIDAZOLE	583-39-1	45
2-MERCAPTOBENZOTHIAZOLE	149-30-4	45
MERCURIC CHLORIDE	7487-94-7	45
METALS, TRACE		21
METHAFURYLENE	531-06-6	9
METHAPHENILENE	493-78-9	9
METHAPYRILENE	91-80-5	9
METHAPYRILENE	91-80-5	9
METHAPYRILENE	91-80-5	60
METHAPYRILENE HYDROCHLORIDE	135-23-9	8
METHAPYRILENE HYDROCHLORIDE	135-23-9	17
METHDILAZINE	1982-37-2	45
2-METHOXY-DMBA		12
3-METHOXY-DMBA	66240-02-6	12
4-METHOXY-DMBA	16277-49-9	12
8-METHOXYPSORALEN	298-81-7	45
N-METHYL-4-AMINOAZOBENZENE	621-90-9	61
METHYLAZOXYETHANE		2
METHYLAZOXYMETHANE		2
METHYLAZOXYMETHANE-D3		2
1-METHYLBENZ(A)ANTHRACENE	2498-77-3	61
2-METHYLBENZ(A)ANTHRACENE	2498-76-2	61
3-METHYLBENZ(A)ANTHRACENE	2498-75-1	61
4-METHYLBENZ(A)ANTHRACENE	316-49-4	61
5-METHYLBENZ(A)ANTHRACENE	2319-96-2	61
6-METHYLBENZ(A)ANTHRACENE	316-14-3	61
7-METHYLBENZ(A)ANTHRACENE	2541-69-7	61
8-METHYLBENZ(A)ANTHRACENE	2381-31-9	61
9-METHYLBENZ(A)ANTHRACENE	2381-16-0	61
10-METHYLBENZ(A)ANTHRACENE	2381-15-9	61
11-METHYLBENZ(A)ANTHRACENE	6111-78-0	61
12-METHYLBENZ(A)ANTHRACENE	2422-79-9	61
6-METHYLBENZO(A)PYRENE	2381-39-7	61
8-METHYLBENZO(A)PYRENE	63041-76-9	61

CHEMICAL	CAS NO.	PAGE
10-METHYLBENZO(A)PYRENE	63104-32-5	61
7-METHYLBENZ(A)PYRENE	63041-77-0	62
ALPHA-METHYLBENZYL ALCOHOL	98-85-1	45
METHYL BROMIDE	74-83-9	45
METHYLCHOLANTHRENE	56-49-5	90
METHYL CARBAMATE	598-55-0	45
METHYLDOPA	555-30-6	45
METHYLENE CHLORIDE	75-09-2	45
METHYL METHACRYLATE	80-62-6	45
METHYL METHANESULFONATE	66-27-3	62
2-METHYLNITROSOMORPHOLINE	75881-16-2	2
2-METHYLNITROSO-1,3-OXAZOLIDINE	39884-53-2	2
5-METHYLNITROSO-1,3-OXAZOLIDINE	35631-27-7	2
3-METHYLNITROSO-4-PIPERIDONE		3
N-METHYL-N-NITROSOUREA	684-93-5	62
N-METHYLOLACRYLAMIDE	924-42-5	45
METHYLPHENIDATE HCl	298-59-9	45
MIREX	2385-85-5	45
MNNG/TPA/BPO (N-METHYL-N'NITRO-N-NITR	70-25-7	45
MOLYBDENUM TRIOXIDE	1313-27-5	45
MONOCHLOROACETIC ACID	79-11-8	45
MONURON	150-68-5	9
MORPHOLINE HYDROCHLORIDE	10024-89-2	11
MORPHOLINE HYDROCHLORIDE	10024-89-2	11
MORPHOLINE HYDROCHLORIDE	10024-89-2	11
MORPHOLINE HYDROCHLORIDE	10024-89-2	11
MORPHOLINE NITROSOPROLINE SALT		11
NALIDIXIC ACID	389-08-2	45
NAPHTHALENE	91-20-3	45
2-NAPHTHYLAMINE	91-59-8	62
NAVY FUELS JP-5		45
NICKEL OXIDE	1313-99-1	45
NICKEL SUBSULFIDE	12035-77-3	45
NICKEL SULFATE HEXAHYDRATE	10101-97-0	45
NITRITE	14797-65-0	9
NITRITE	14797-65-0	9
NITRITE	14797-65-0	9
NITRITE	14797-65-0	9
NITRITE	14797-65-0	9
NITRITE	14797-65-0	9
NITRITE	14797-65-0	9
NITRITE	14797-65-0	9
NITRITE	14797-65-0	9
NITRITE	14797-65-0	9
NITRITE	14797-65-0	10
NITRITE	14797-65-0	10
O-NITROANISOLE	91-23-6	45
6-NITROBENZO(A)PYRENE	63041-90-7	62

CHEMICAL	CAS NO.	PAGE
4-NITROBIPHENYL	92-93-3	62
2-NITROFLUORENE	607-57-8	62
NITROFURANTOIN	67-20-9	46
NITROFURAZONE	59-87-0	46
1-NITRONAPHTHALENE	86-57-7	62
P-NITROPHENOL	100-02-7	46
NITROSO-2-ACETOXYDIBENZYLAMINE		3
4'-NITROSO-N-ACETYL-4-AMINOBIPHENYL		63
NITROSO-4-ACETYL-3,5-DIMETHYLPIPERAZINE	75881-17-3	3
NITROSOALLYLETHANOLAMINE		3
NITROSOALLYLHYDROXYPROPYLAMINE		17
NITROSOALLYL-2-HYDROXYPROPYLAMINE		3
NITROSOALLYLOXOPROPYLAMINE		17
NITROSOALLYLUREA	760-56-5	12
NITROSO-N-AMYLUREA	10589-74-9	12
NITROSOAZETIDINE	15216-10-1	17
1-NITROSO-4-BENZOYL-3,5-DIMETHYLPIPERAZINE	61034-40-0	3
NITROSOBENZYLUREA	775-11-1	12
4-NITROSOBIPHENYL	10125-76-5	63
NITROSOBIS-(2-HYDROXYPROPYLAMINE		17
NITROSOBIS-(2-HYDROXYPROPYL)-A-MINE		3
NITROSO-BIS-(2-OXOPROPYL)-AMINE	60599-38-4	17
NITROSO-BIS-(2-OXOPROPYL)-AMINE	60599-38-4	3
NITROSO-N-BUTYLUREA	869-01-2	12
NITROSO-SEC-BUTYLUREA	71752-66-4	12
NITROSOCARBARYL	64158-97-0	12
NITROSOCHLOROETHYLDIETHYLUREA	69113-00-4	12
NITROSOCHLOROETHYLDIMETHYLUREA	59960-30-4	12
1-NITROSO-1-(2-CHLOROETHYL)-3-(2-HYDROXYETHYL)-UREA		3
1-NITROSO-1-(2-CHLOROETHYL)-3-(2-HYDROXYPROPYL)-UREA		3
NITROSOCIMETIDINE	73785-40-7	3
NITROSOCIMETIDINE	73785-40-7	12
NITROSOCYCLOHEXYLUREA	877-31-6	12
NITROSODI-N-BUTYLAMINE	924-16-3	3
NITROSODIETHANOLAMINE	1116-54-7	3
NITROSODIETHANOLAMINE		17
NITROSODIETHYLAMINE		17
NITROSODIHYDROXYPROPYLALLYLAMINE		3
NITROSODIHYDROXYPROPYLALLYLAMINE		17
NITROSODIHYDROXYPROPYLETHANOLAMINE		3
NITROSODIHYDROXYPROPYLETHANOLAMINE		17
NITROSODIHYDROXYPROPYL-2-HYDRO-XYPROPYLAMINE		3
NITROSODIHYDROXYPROPYLOXOPROPYLAMINE		17
NITROSODIHYDROXYPROPYLOXOPROPYLAMINE		3
NITROSODIISOBUTYLAMINE	997-95-5	3
NITROSODIMETHYLAMINE	62-75-9	3
NITROSODIMETHYLAMINE	62-75-9	17
NITROSODI-N-PROPYLAMINE	621-64-7	3

CARCINOGENESIS

CHEMICAL	CAS NO.	PAGE
NITROSODITHIAZINE		3
NITROSOETHANOLISOPROPANOLAMINE		3
NITROSOETHYLCYCLOHEXYLAMINE		4
1-NITROSO-1-ETHYL-3-(2-HYDROXYETHYL)-UREA		3
1-NITROSO-1-ETHYL-3-(2-HYDROXY)UREA		17
NITROSOETHYLNITROGUANIDINE		12
NITROSOETHYLNITROGUANIDINE-D5		12
NITROSOETHYLUREA	759-73-9	3
NITROSOETHYLUREA	759-73-9	12
NITROSOETHYLUREA		17
NITROSOETHYLUREA-D5		12
NITROSOETHYLURETHANE	614-95-9	4
NITROSOETHYLURETHANE	614-95-9	8
NITROSOETHYLURETHANE	614-95-9	12
NITROSOETHYL-D5-URETHANE		3
N-NITROSO-N-ETHYLURETHANE	614-95-9	17
NITROSO-2-FLUOROETHYLUREA	69112-98-7	12
NITROSOHEPTAMETHYLENEIMINE	20917-49-1	4
NITROSOHEPTAMETHYLENEIMINE	20917-49-1	8
NITROSOHEPTAMETHYLENEIMINE-D4		4
NITROSOHEXAMETHYLENEIMINE	932-83-2	4
NITROSO-N-HEXYLUREA	18774-85-1	12
1-NITROSO-1-(2-HYDROXYETHYL)-3-(2-CHLOROETHYL)-UREA		4
1-NITROSO-1-(2-HYDROXYETHYL)-3-ETHYLUREA		17
1-NITROSO-1-(2-HYDROXYETHYL)-3--ETHYLUREA		4
NITROSOHYDROXYETHYLUREA	13743-07-2	17
NITROSO-2-HYDROXYETHYLUREA	13743-07-2	4
NITROSO-2-HYDROXYETHYLUREA	13743-07-2	12
NITROSOHYDROXYMETHYLOXAZOLIDONE		4
NITROSOHYDROXYPROLINE	30310-80-6	11
NITROSOHYDROXYPROLINE SALT		11
1-NITROSO-1-(2-HYDROXYPROPYL)-3-(2-CHLOROETHYL)-UREA		4
NITROSOHYDROXYPROPYLOXOPROPYLAMINE		17
NITROSOHYDROXYPROPYLOXOPROPYLAMINE	61499-28-3	4
NITROSO-2-HYDROXYPROPYLUREA	71752-69-7	4
NITROSO-2-HYDROXYPROPYLUREA	71752-69-7	12
NITROSO-2-HYDROXYPROPYLUREA	71752-69-7	17
NITROSO-3-HYDROXYPROPYLUREA	71752-70-0	12
NITROSOISOBUTYLUREA	760-60-1	12
NITROSOISOPROPANOLETHANOLAMINE		17
NITROSO-ISOPROPYLUREA	16830-14-1	12
NITROSOMETHYLANILINE	614-00-6	4
NITROSO-N-METHYLANILINE	614-00-6	17
NITROSOMETHYLBENZYLAMINE	937-40-6	4
NITROSOMETHYLBIS-CHLOROETHYLUREA	69112-99-8	12
NITROSOMETHYL-D3-N-BUTYLAMINE		4
NITROSOMETHYL-N-BUTYLAMINE	7068-83-9	4
NITROSOMETHYL-N-BUTYL(1-D2)-AMINE		4

CHEMICAL	CAS NO.	PAGE
NITROSOMETHYLCARBOXYPROPYLAMINE		4
NITROSOMETHYL-3-CARBOXYPROPYLAMINE		4
NITROSOMETHYLCYCLOHEXYLAMINE	5432-28-0	4
NITROSOMETHYLCYCLOHEXYLAMINE-D3		4
NITROSOMETHYL-N-DECYLAMINE	7516-82-7	4
NITROSOMETHYLDIETHYLUREA	51285-72-8	17
NITROSOMETHYLDIHYDROXYPROPYLAMINE		18
NITROSOMETHYL-2,3-DIHYDROXYPROPYLAMINE		4
NITROSOMETHYLDODECYLAMINE	55090-44-3	8
NITROSOMETHYLDODECYLAMINE	55090-44-3	4
NITROSOMETHYLDODECYLAMINE	55090-44-3	7
NITROSOMETHYLDODECYLAMINE-D2		4
NITROSOMETHYLDODECYLAMINE-D3		4
NITROSOMETHYLETHYLAMINE	10595-95-6	7
NITROSOMETHYLETHYLAMINE	10595-95-6	4
NITROSOMETHYLETHYLAMINE		18
NITROSOMETHYLETHYL-(2-D3)-AMINE		4
NITROSOMETHYLETHYLAMINE-D-8		4
NITROSOMETHYLETHYLAMINE-D2		4
NITROSOMETHYLETHYLAMINE-D3		4
NITROSOMETHYLETHYLAMINE-D5		4
NITROSOMETHYL-4-FLUOROANILINE	937-25-7	5
NITROSOMETHYL-N-HEPTYLAMINE	16338-99-1	5
NITROSOMETHYL-N-HEXYLAMINE	28538-70-7	18
NITROSOMETHYL-N-HEXYLAMINE	28538-70-7	5
NITROSOMETHYL-2-HYDROXYPROPYLAMINE		5
NITROSOMETHYL-2-HYDROXYPROPYLAMINE		18
NITROSO-2-METHYLMORPHOLINE	75881-16-2	18
NITROSOMETHYLNEOPENTYLAMINE	13256-07-0	5
NITROSOMETHYL-4-NITROANILINE	943-41-9	5
NITROSOMETHYLNITROGUANIDINE	70-25-7	5
NITROSOMETHYLNITROGUANIDINE	70-25-7	12
NITROSOMETHYLNITROGUANIDINE-D3		12
NITROSOMETHYL-N-NONYLAMINE	75881-19-5	5
NITROSOMETHYL-N-OCTYLAMINE	34423-54-6	5
NITROSO-5-METHYLOXAZOLIDONE	35631-27-7	5
NITROSO-5-METHYLOXAZOLIDONE	35631-27-7	12
NITROSO-5-METHYLOXAZOLIDINE	35631-27-7	18
NITROSO-5-METHYLOXAZOLIDONE	35631-27-7	18
NITROSOMETHYL-2-OXOPROPYLAMINE		5
NITROSOMETHYL-2-OXOPROPYLAMINE		18
NITROSOMETHYLPHENYLETHYLAMINE	13256-11-6	5
NITROSOMETHYLPHENYLETHYLAMINE-D2		5
NITROSOMETHYLPHENYLETHYLAMINE-D3		5
NITROSOMETHYLPIPERAZINE	109-01-3	11
NITROSO-3-METHYL-DELTA-3-PIPERIDINE	75881-15-1	5
NITROSOMETHYL-N-PROPYLAMINE	924-46-9	5
NITROSOMETHYL-N-TETRADECYLAMINE	75881-20-8	5

STUDY TYPE INDEX

CHEMICAL	CAS NO.	PAGE
NITROSOMETHYL-2-TRIFLUOROETHYLAMINE	819-35-2	5
NITROSOMETHYLUREA	684-93-5	5
NITROSOMETHYLUREA	684-93-5	12
NITROSOMETHYLUREA-D3	68426-45-9	12
NITROSOMETHYLURETHANE	615-53-2	5
NITROSOMETHYLURETHANE	615-53-2	7
NITROSOMETHYLURETHANE	615-53-2	7
NITROSOMETHYLURETHANE	615-53-2	12
NITROSO-METHYL-D3-URETHANE		4
NITROSOMORPHOLINE		5
NITROSOMORPHOLINE	59-89-2	11
NITROSOMORPHOLINE	59-89-2	18
NITROSOMORPHOLINE-3,3,5,5-D4		18
1-NITROSONAPHTHALENE	21711-65-9	63
NITROSOOXAZOLIDINE	39884-52-1	18
NITROSO-1,3-OXAZOLIDINE	39884-52-1	5
NITROSOOXAZOLIDONE	38347-74-9	5
NITROSOOXAZOLIDONE	38347-74-9	18
NITROSOOXOPROPYLALLYLAMINE		5
NITROSOOXOPROPYLETHANOLAMINE		18
NITROSOOXOPROPYLETHANOLAMINE		5
NITROSOPHENYLBENZYLAMINE	612-98-6	11
NITROSO-2-PHENYLETHYLUREA	777-79-7	12
NITROSOPHENYLUREA	6268-32-2	12
NITROSOPIPERIDINE	100-75-4	5
NITROSO-DELTA-2-PIPERIDINE	70501-82-5	5
NITROSO-4-PIPERIDONE	55556-91-7	5
NITROSOPROLINE	55514-93-7	11
NITROSO-N-PROPYLUREA	816-57-9	12
NITROSOPYRROLIDINE	930-55-2	5
NITROSOTETRAHYDRO-1,3-OXAZINE	40548-68-3	5
NITROSOTETRAHYDROPYRIDINE	55556-92-8	5
NITROSOTHIALDINE		5
NITROSOTHIAZOLIDINE		5
NITROSO-N-TRIDECYLUREA	71752-68-6	12
NITROSOTRIETHYLUREA		18
NITROSOTRIHYDROXYDIPROPYLAMINE		18
NITROSOTRIMETHYLPIPERAZINE	75881-18-4	18
NITROSO-3,4,5-TRIMETHYLPIPERAZINE	75881-18-4	6
NITROSO-TRIS-CHLOROETHYLUREA	71162-64-6	13
NITROSO-N-UNDECYLUREA	71752-67-5	13
P-NITROTOLUENE	99-99-0	46
OCHRATOXIN A	303-47-9	46
OIL SHALE		118
OLEIC ACID DIETHANOLAMINE SALT	13961-86-9	46
OLIVE OIL		8
ORGANIC CHLORAMINES		120
OXYTETRACYCLINE HCL	2058-46-0	46

CHEMICAL	CAS NO.	PAGE
PARTICLES FROM OIL SHALE RETORTING		118
PENICILLIN V POTASSIUM	132-98-9	46
PENTACHLOROANISOLE	1825-21-4	46
PENTACHLORONITROBENZENE	82-68-8	46
PENTACHLOROPHENOL, DOWICIDE EC-7	87-86-5	46
PENTACHLOROPHENOL, TECHNICAL	87-86-5	46
PENTAERYTHRITOL TETRANITRATE	78-11-5	46
PHENOBARBITAL	50-06-6	63
PHENYLBUTAZONE	50-33-9	46
PHENYLEPHRINE HYDROCHLORIDE	61-76-7	46
N-PHENYL-2-NAPHTHYLAMINE	135-88-6	46
4-PHENYLNITROSOPIPERIDINE	6652-04-6	6
O-PHENYLPHENOL	90-43-7	46
PHORBOL ESTERS		91
PIPERINE	94-62-2	9
POLYBROMINATED BIPHENYL (FF-I)	36355-01-8	46
PRIORITY AIR POLLUTANTS		121
PROBENECID	57-66-9	46
PROMETHAZINE HYDROCHLORIDE	58-33-3	46
PYRIDINE	110-86-1	46
PYRILAMINE MALEATE	59-33-6	9
QUERCETIN	117-39-5	46
QUINACRINE	83-89-6	9
QUINACRINE	83-89-6	9
QUINOLINES		20
RESORCINOL	108-46-3	46
RHODAMINE 6G	989-38-8	46
RICIN	9009-86-3	91
ROTENONE	83-79-4	46
ROXARSONE	121-19-7	46
SALICYLAZOSULFAPYRIDINE	599-79-1	46
SCOPOLAMINE HYDROBROMIDE	51-34-3	46
SCOPOLAMINE HYDROBROMIDE	51-34-3	46
SILVER	7440-22-4	121
SODIUM AZIDE	26628-22-8	46
SODIUM DODECYL SULFATE	151-21-3	46
SODIUM FLUORIDE	7681-49-4	46
SODIUM NITRITE	7632-00-0	9
SODIUM NITRITE	7632-00-0	11
SODIUM THIOCYANATE	540-72-7	11
SODIUM THIOCYANATE	540-72-7	11
SODIUM THIOCYANATE	540-72-7	11
SODIUM THIOCYANATE	540-72-7	11
SODIUM THIOCYANATE	540-72-7	11
SODIUM THIOCYANATE	540-72-7	11
STYRENE OXIDE	96-09-3	46
SUCCINIC ANHYDRIDE	108-30-5	46
SULFAMETHAZINE	57-68-1	64

STUDY TYPE INDEX

CARCINOGENESIS

CHEMICAL	CAS NO.	PAGE
SULFAMETHAZINE	57-68-1	64
TALC	14807-96-6	46
TETRACHLOROETHYLENE	127-18-4	46
TETRACHLOROETHYLENE	127-18-4	46
TETRACHLOROETHYLENE	127-18-4	121
TETRACHLOROPHTHALIC ANHDRIDE	117-08-8	46
TETRACYCLINE HYDROCHLORIDE	64-75-5	46
TETRAFLUOROETHYLENE	116-14-3	46
1-TRANS-DELTA-9-TETRAHYDROCANNABINOL	1972-08-3	46
1,2,3,4-TETRAHYDRO-DMBA	67242-54-0	13
TETRAHYDROFURAN	109-99-9	47
TETRAHYDROFURAN	109-99-9	46
TETRANITROMETHANE	509-14-8	47
THENYLDIAMINE	91-79-2	9
THEOPHYLLINE	58-55-9	47
4,4'-THIOBIS(6-TERT-BUTYL-MCRESOL)	96-69-5	47
THIRAM	137-26-8	10
THPC	124-64-1	47
THPS	55566-30-8	47
TITANIUM FERROCENE	1271-19-8	47
D-ALPHA-TOCOPHERYL ACETATE	58-95-7	47
TOLBUTAMIDE	64-77-7	10
TOLUENE	108-88-3	47
TPA	41479-14-5	44
TRIAMTERENE	396-01-0	47
TRICHLORFON	52-68-6	47
TRICHLOROETHYLENE	79-01-6	47
TRICHLOROETHYLENE	79-01-6	47
TRICHLOROETHYLENE	79-01-6	47
TRICHLOROETHYLENE	79-01-6	47
TRICHLOROETHYLENE	79-01-6	121
TRICHLOROETHYLENE (WITHOUT EPICHLOROHYDR)	79-01-6	47
TRICHLOROETHYLENE (WITHOUT EPICHLOROHYDR)	79-01-6	47
1,2,3-TRICHLOROPROPANE	96-18-4	47
TRICRESYL PHOSPHATE	1330-78-5	47
TRIETHANOLAMINE	102-71-6	47
TRIETHYLNITROSOUREA	50285-70-6	6
TRIMETHYLNITROSOUREA	3475-63-6	6
TRIS(2-CHLOROETHYL) PHOSPHATE	115-96-8	47
TUMERIC (CURCUMIN)	458-37-7	47
TUNGSTEN CARBIDE	12070-12-1	47
VINYL ACETATE	108-05-4	6
VINYL CHLORIDE	75-01-4	20
4-VINYLCYCLOHEXENE	100-40-3	47
VINYL CYCLOHEXENE DIOXIDE	106-87-6	47
VINYLIDINE FLUORIDE	75-38-7	47
VINYLTOLUENE	25013-15-4	47
WOLLASTONITE CALCIUM SILICATE	13983-17-0	47
XYLENE	1330-20-7	47
XYLENESULFONIC ACID, SODIUM SALT	1300-72-7	47

CHEMISTRY METHODS

CHEMICAL	CAS NO.	PAGE
PENICILLAMINE HYDROCHLORIDE	2219-30-9	63

316<

STUDY TYPE INDEX

CHRONIC TOXICITY

CHEMICAL	CAS NO.	PAGE	CHEMICAL	CAS NO.	PAGE
ACETAMINOPHEN	103-90-2	109	IMIDAZOLIDINES		82
ACROLEIN	107-02-8	80	5-IODO-5'-AMINO-2',5'DIDEOXYCYTIDINE (AIC)		111
ADENINE NUCLEOTIDES		97	5-IODO-5'-AMINO-2',5'DIDEOXYURIDINE (AIU)		111
ADRIAMYCIN	23214-92-8	86	5'-IODO-2'-DEOXYURIDINE (DOXURIDINE)	54-42-2	111
ADRIAMYCIN	23214-92-8	109	LEVONORGESTREL		72
ALIPHATIC NITRILES		78	LEVONORGETREL		72
ALLETHRIN	584-79-2	97	LITHIUM	7439-93-2	115
5'-AMINO-5'-DEOXYTHYMIDINE (ATdR)		109	LITHIUM	7439-93-2	115
AMINOPYRIDINES		98	METHOTREXATE	59-05-2	111
ANTHOPLEURIN-A	60880-63-9	98	METHOTREXATE	59-05-2	111
APOMORPHINE	58-00-4	98	METHOTREXATE GAMMA ASPARTATE		111
ASPIRIN	50-78-2	88	METHYL DEMETON	8022-00-2	102
AZATHIOPRINE	446-86-6	88	NEUROLEPTICS		115
BIS-(THIOACETOXYL)AURATE(I)		98	NEUROLEPTICS		115
BLEOMYCIN	11056-06-7	80	NEUROLEPTICS		115
BOTULINUM TOXIN		98	NEUROLEPTICS		115
BETA-BUNGAROTOXIN	12778-32-4	98	NEUROLEPTICS		115
CANNABINOIDS		110	NEUROTOXINS		104
CARBOXYLIC ACIDS		78	NEUROTOXINS		107
CHIRIQUITOXIN	61132-15-8	99	NIFEDIPINE	21829-25-4	78
1,8-CINEOLE	470-82-6	56	NITRILES		78
1,8-CINEOLE	470-82-6	56	NITRITE	14797-65-0	78
CINNAMALDEHYDE	104-55-2	56	NITRITES		78
CYANIDE		78	NITROFURANTOIN	67-20-9	82
CYCLIC AMP	60-92-4	100	NITROGEN DIOXIDE	10102-44-0	120
CYCLOPHOSPHAMIDE	50-18-0	88	NITROGEN DIOXIDE	10102-44-0	120
DAUNOMYCIN	20830-81-3	86	NITROPRUSSIDE	15078-28-1	78
DAUNORUBICIN	20830-81-3	87	NITROPRUSSIDE	13755-38-9	78
DDT	50-29-3	100	OPIATES		87
DEMETON	8065-48-3	100	OZONE	10028-15-6	120
DESIPRAMINE	50-47-5	87	OZONE	10028-15-6	120
DEXAMETHASONE	50-02-2	110	PALYTOXIN	11077-03-5	105
DIAZACHOLESTEROL	313-05-3	100	PARACHLOROPHENYLALANINE	1991-78-2	105
DIETHYLSTILBESTROL	56-53-1	57	PHENYLALKYL AMINES		79
5,6-DIHYDROXYTRYPTAMINE	5090-36-8	100	PHOSPHORAMIDE		83
DOPA	59-92-7	101	PICROTOXIN	124-87-8	79
ESTRADIOL	50-28-2	58	PYRIDINE	110-86-1	79
5-FLUORO-2'-DEOXYURIDINE (FUdR)		110	RAUWOLFIA ALKALOIDS		106
5-FLUOROURACIL (5-FU)	51-21-8	110	RESERPINE	50-55-5	106
FUROSEMIDE	54-31-9	87	RUTHENIUM	7440-18-8	79
FUROSEMIDE	54-31-9	87	RUTHENIUM COORDINATION COMPLEXES		79
GENTAMICIN	1403-66-3	110	SALICYLATES		106
GRAYANOTOXIN	1399-60-6	101	SAXITOXIN	35523-89-8	107
HEPARIN		85	SAXITOXIN	35523-89-8	106
HEPARIN-DERIVED ANTICOAGULANTS		85	STREPTOXOTOCIN	18883-66-4	91
HYDANTOINS		81	STREPTOZOTOCIN	18883-66-4	91
HYDROCHLORIC ACID	7647-01-0	81	STREPTOZOTOCIN	18883-66-4	91
6-HYDROXYDOPAMINE	1199-18-4	101			

CHRONIC TOXICITY

STUDY TYPE INDEX

CHEMICAL	CAS NO.	PAGE
STREPTOZOTOCIN	18883-66-4	91
SULFAMETHAZINE	57-68-1	64
SYNTHETIC PYRETHROIDS		108
TETANUS TOXIN		98
TETANUS TOXIN		108
TETRODOTOXIN	4368-28-9	79
TETRODOTOXIN	4368-28-9	79
TETRODOTOXIN	4368-28-9	108
TETRODOTOXIN ANALOGS		108
TOBRAMYCIN	32986-56-4	112
5'-TRIFLUOROMETHYL-5'-AMINO2',5'-DIDEOXYURIDINE (AF3U)		112
VANADATE		112
VERAPAMIL	52-53-9	79
VERAPAMIL	52-53-9	79
VERATRIDINE	71-62-5	108

317<

CHRONIC TOXICITY/CARCINOGENICITY

CHEMICAL	CAS NO.	PAGE
PYRILAMINE	91-84-9	64

318<

-788 O - 85 - 11 : QL 3

STUDY TYPE INDEX

CLINICAL TOXICOLOGY/EPIDEMIOLOGY

CHEMICAL	CAS NO.	PAGE
ACETAMINOPHEN	103-90-2	75
ACYCLOVIR	59277-89-3	93
ADENINE ARABINOSIDE	5536-17-4	93
ADENINE ARABINOSIDE MONOPHOSPHATE	29984-33-6	93
AEROSOLS		80
AFLATOXIN	1402-68-2	51
AFLATOXIN	1402-68-2	51
ALCOHOL	64-17-5	74
ALCOHOL	64-17-5	76
ALUMINUM	7429-90-5	88
5'-AMINO-5'-DEOXYTHYMIDINE (ATdR)		109
ANTIBIOTICS		75
ANTICONVULSANTS		103
ANTICONVULSANTS		103
ANTICONVULSANTS		107
ASBESTOS	1332-21-4	80
ASPIRIN	50-78-2	75
ASPIRIN	50-78-2	88
AZATHIOPRINE	446-86-6	88
2-ALPHA-BROMOERGOCRIPTINE	25614-03-3	70
CAFFEINE	58-08-2	76
CATECHOLAMINES		98
CHLORINE GAS	7782-50-5	81
CLOMIPHENE CITRATE	50-41-9	71
COFFEE DUST		81
CONTRACEPTIVE ESTROGENS AND PROGESTINS		73
CONTRACEPTIVE SPERMICIDES		73
COTTON DUST		81
CYCLOPHOSPHAMIDE	50-18-0	88
DDT	50-29-3	69
DESIPRAMINE	50-47-5	87
DICHLORODIPHENYLETHYLENE	72-55-9	21
DIURETICS		98
BETA-ENDORPHIN	61214-51-5	70
ENFLUREANE	13838-16-9	89
ENVIRONMENTAL AGENTS		70
GOLD		90
GONADATROPIC RELEASING HORMONE ANALOGS		70
GONADOTROPIC RELEASING HORMONE ANALOGS		70
GONADOTROPIC RELEASING HORMONE ANALOGS		70
HEPARIN	9005-49-6	75
HYDROGEN PEROXIDE	7722-84-1	113
INTERFERON	9008-11-1	111
5'-IODO-2'-DEOXYURIDINE (DOXURIDINE)	54-42-2	111
KAOLIN	1332-58-7	82
LEAD	7439-92-1	74
ALPHA-MELANOCYTE STIMULATING HORMONE	9002-79-3	70
METHYL MERCURY	22967-92-6	52

CHEMICAL	CAS NO.	PAGE
NALOXONE	465-65-6	102
NEUROTOXINS		97
NEUROTOXINS		104
NICOTINE	54-11-5	74
NICOTINE	54-11-5	76
NITROGEN DIOXIDE	10102-44-0	120
NITROGEN OXIDES		82
OCHRATOXIN	37203-43-3	52
OCHRATOXIN A	303-47-9	90
OIL SHALE PRODUCTS		118
OZONE	10028-15-6	83
OZONE	10028-15-6	121
PANCURONIUM BROMIDE	15500-66-0	75
PBB'S		52
PCB'S		21
PENICILLAMINE	52-67-5	90
PERGOLIDE MESYLATE	66104-23-2	71
PHENYLALKYL AMINES		79
PHORBOL ESTERS		91
POLYBROMINATED BIPHENYLS		22
POLYBROMINATED BIPHENYL	36355-01-8	69
POLYCHLORINATED BIPHENYLS		22
POLYCHLORINATED BIPHENYLS		22
POLYCHLORINATED BIPHENYLS		22
POLYCHLORINATED BIPHENYL		69
RADON	10043-92-2	121
RICIN	9009-86-3	91
SHALE OIL PRODUCTS		118
SILICA	7631-86-9	83
SULFUR DIOXIDE	7466-09-5	121
TETRODOTOXIN	4368-28-9	79
TOLUENE DIISOCYANATE	26471-62-5	84
5'-TRIFLUOROMETHYL-5'-AMINO2',5'-DIDEOXYURIDINE (AF3U)		112
VERAPAMIL	52-53-9	79

CHEMICAL	CAS NO.	PAGE
N-PROPIONYL-N-HYDROXY-2-AMINOFLUORENE	52663-84-0	64

320<

STUDY TYPE INDEX

DERMAL TOXICITY
SKIN PAINTING

CHEMICAL	CAS NO.	PAGE
ACETOETHYLTETRAMETHYLTETRALIN		51
DIESEL FUEL MARINE		43
NAVY FUELS JP-5		45
N-NITROSO-N-METHYLDODECYLAMINE	75356-79-5	52
N-NITROSO-N-METHYLOCTADECYLAMINE		52

321<

FIBROGENESIS

CHEMICAL	CAS NO.	PAGE
COPPER SLAGS	7440-50-8	67

CHEMICAL	CAS NO.	PAGE
ACEBUTOLOL	37517-30-9	65
N-ACETOXY-N-TRIFLUOROACETYL-4-AMINOBIPHENYL		54
AEROALLERGENS		80
AEROSOLS		80
4-AMINOBIPHENYL	92-67-1	54
AMMONIUM NITRATE	6484-52-2	119
AMMONIUM SULFATE	7783-20-2	119
ANTICONVULSANTS		100
ASBESTOS	1332-21-4	80
AZATHIOPRINE	446-86-6	88
CAFFEINE	58-08-2	51
CHLORINE GAS	7782-50-5	81
COAL LIQUEFACTION MATERIALS		117
COAL LIQUEFACTION MATERIALS		117
COFFEE DUST		81
COTTON DUST		81
CYCLOPHOSPHAMIDE	50-18-0	88
DEMETHYLCHLORTETRACYCLINE	127-33-3	89
DIPHENYLHYDANTOIN	57-41-0	58
GOLD		90
GOLD SODIUM THIOMALATE	39377-38-3	65
GOLDTHIOMALATE	39377-38-3	65
HALOCARBONS		87
HYDRALAZINE	86-54-4	65
INTERFERON	9008-11-1	94
KAOLIN	1332-58-7	82
LINDANE	58-89-9	60
LINDANE	58-89-9	60
MERCURIC CHLORIDE	7487-94-7	65
MERCURIC CHLORIDE	7487-94-7	65
METHYL XANTHINES		52
METHYLDOPA	555-30-6	66
METHYLDOPA	555-30-6	66
NEUROTOXINS		104
NITROFURANTOIN	67-20-9	66
NITROFURANTOIN	67-20-9	66
NITROGEN DIOXIDE	10102-44-0	120
NITROGEN DIOXIDE	10102-44-0	120
OCHRATOXIN A	37203-43-3	21
OZONE	10028-15-6	120
OZONE	10028-15-6	120
OZONE	10028-15-6	121
PARTICULATES		121
PENICILLAMINE	52-67-5	90
D-PENICILLAMINE	52-67-5	66
POLYBROMINATED BIPHENYLS		22
PRACTOLOL	6673-35-4	66
PROCAINAMIDE	51-06-9	66

CHEMICAL	CAS NO.	PAGE
PROCAINAMIDE	51-06-9	66
PROPRANOLOL	525-66-6	66
SILICA	7631-86-9	83
STAPHYLOCOCCAL ENTEROTOXINS		52
SULFUR DIOXIDE	7446-09-5	121
SULFUR DIOXIDE	7446-09-5	121
SULFURIC ACID	7664-93-9	121
TENUAZONIC ACID		52
TOLUENE DIISOCYANATE	26471-62-5	84
VANADIUM PENTOXIDE	1314-62-1	68

323<

IMMUNOLOGIC TOXICITY/NUTRITIONAL STUDIES

CHEMICAL	CAS NO.	PAGE
COPPER		51

CHEMICAL	CAS NO.	PAGE
METHYLENE CHLORIDE	75-09-2	45

325<

LIGHT ACTIVATION

CHEMICAL	CAS NO.	PAGE
POLYNUCLEAR AROMATIC HYDROCARBONS		118

327<

MUTAGENESIS/GENETIC TOXICITY

STUDY TYPE INDEX

CHEMICAL	CAS NO.	PAGE
ABIETIC ACID	514-10-3	14
ABIETIC ACID	514-10-3	16
ACETALDEHYDE	75-07-0	36
ACETALDEHYDE	75-07-0	16
ACETALDEHYDE	75-07-0	14
ACETAMINOPHEN	103-90-2	109
ACETIN	26446-35-5	36
N-ACETOXY-N-ACETYL-1-AMINOPYRENE		54
N-ACETOXY-AMINOFLUORENE		54
2-ACETYLAMINOFLUORENE	53-96-3	54
4-ACETYLAMINOFLUORENE	28322-02-3	48
2-ACETYLAMINO-4-METHYLPHENOL	6375-17-3	23
N-ACETYL-M-AMINOPHENOL	621-42-1	23
N-ACETYL-1-AMINOPYRENE		54
N-ACETYL-N-HYDROXY-1-AMINOPYRENE		54
ACETYLSALICYLIC ACID	50-78-2	23
N4-ACETYLSULFAMETHAZINE	100-90-3	54
N-ACETYL-M-TOLUIDINE	537-92-8	23
N-ACETYL-P-TOLUIDINE	103-89-9	23
ACRYLONITRILE	107-13-1	40
ADIPONITRILE	111-69-3	23
AGARITINE	2757-90-6	23
ALDICARB	116-06-3	23
ALKYLATING AGENTS		117
ALLOXAN	50-71-5	23
ALLOXAN MONOHYDRATE	3237-50-1	23
ALLOXAN MONOHYDRATE	3237-50-1	36
ALLYL ISOTHIOCYANATE	57-06-7	48
ALLYL THIOUREA	109-57-9	23
AMILORIDE HCL	2016-88-8	23
2-AMINOACETANILIDE	555-48-6	23
2-AMINOANTHRACENE	613-13-8	36
5-(4-AMINOBENZAMIDO)-2,3-CRESOTIC ACID	6265-15-2	23
2-AMINOBENZENESULFONIC ACID	88-21-1	23
3-AMINOBENZENESULFONIC ACID	121-47-1	23
4-AMINOBENZENESULFONIC ACID	121-57-3	23
2-AMINOBENZIMIDAZOLE	934-32-7	23
6-AMINOBENZO(A)PYRENE	7428-83-3	54
2-AMINO-4-CHLORO-6-NITROPHENOL	6358-08-3	23
2-AMINO-6-CHLORO-4-NITROPHENOL	6358-09-4	23
2-AMINO-4-CHLOROPHENOL	95-85-2	23
6-AMINO-4-CHLORO-1-PHENOL-2-SULFONIC ACID	88-23-3	23
2-AMINO-4,6-DICHLOROPHENOL	527-62-8	23
2-AMINO-4,6-DINITROPHENOL	96-91-3	23
2-AMINOFLUORENE	153-78-6	54
4-AMINO-4q-HYDROXY-3-METHYLDIPHE	6219-89-2	23
1-AMINO-2-METHYLANTHRAQUINONE	82-28-0	23
2-AMINO-4-METHYLPHENOL	95-84-1	23

CHEMICAL	CAS NO.	PAGE
3-AMINO-4-METHYLPHENOL	2836-00-2	23
3-AMINO-6-METHYLPHENOL	2835-95-2	23
2-AMINO-4-(METHYLSULFONYL)PHENOL	98-30-6	23
2-AMINO-3-NITRO-4-METHYLPHENOL	6265-05-0	23
2-AMINO-5-NITRO-4-METHYLPHENOL	6265-06-1	23
6-AMINO-4-NITRO-1-PHENOL-2-SULFONIC	96-67-3	24
2-AMINO-6-NITRO-1-PHENOL-4-SULFONIC ACID	96-93-5	23
2-AMINO-1-PHENOL-4-SULFONIC ACID	98-37-3	24
1-AMINOPYRENE	1606-67-3	54
(3H)-1-AMINOPYRENE		55
3-AMINO-5-SULFOSALICYLIC ACID	6201-86-1	24
5-AMINO-3-SULFOSALICYLIC ACID	6201-87-2	24
3-AMINOTRIAZOLE	61-82-5	24
3-AMINOTRIAZOLE	61-82-5	36
3-AMINOTRIAZOLE	61-82-5	48
2-AMINO-3,4,6-TRICHLOROPHENOL	6358-15-2	24
11-AMINOUNDECANOIC ACID	2432-99-7	48
AMPHETAMINE SULFATE	60-13-9	40
AMPHOTERICIN B	1397-89-3	24
AMPICILLIN TRIHYDRATE	7177-48-2	36
AMYL NITRATE	463-04-7	14
ANILAZINE	101-05-3	24
ANTHRAQUINONE	84-65-1	24
AROCLOR 1254	11097-69-1	24
AROMATIC HYDROCARBONS		20
AROMATIC HYDROCARBONS		20
ASBESTOS	1332-21-4	119
L-ASCORBIC ACID	50-81-7	48
ASPHALTIC BASED PAINTS		119
ATRAZIN	1912-24-9	24
AZA-AROMATIC HYDROCARBONS		20
5-AZACYTIDINE	320-67-2	24
5-AZACYTIDINE	320-67-2	14
5-AZACYTIDINE	320-67-2	16
5-AZACYTIDINE	320-67-2	36
AZATHIOPRINE	446-86-6	88
AZATHIOPRINE	446-86-6	24
1-AZIRIDINEETHANOL	1072-52-2	36
AZODICARBONAMIDE	123-77-3	36
AZOXYMETHANE	25843-45-2	24
BARIUM CHLORIDE DIHYDRATE	10326-27-9	48
BARIUM CHLORIDE DIHYDRATE	10326-27-9	24
BENOMYL	17804-35-2	24
BENZANTHRACENE	56-55-3	55
BENZENE SULFONIC ACID	98-11-3	24
BENZIMIDAZOLE	51-17-2	24
BENZIMIDAZOL-2-YLUREA	24370-25-0	24
BENZOIC ACID	65-85-0	24

MUTAGENESIS/GENETIC TOXICITY

STUDY TYPE INDEX

CHEMICAL	CAS NO.	PAGE
BENZO(E)PYRENE	192-97-2	24
BENZO(A)PYRENE	50-32-8	36
BENZO(A)PYRENE	50-32-8	40
BENZO(A)PYRENE	50-32-8	55
BENZO(A)PYRENE-CIS-7,8-DIHYDRODIOL	60657-25-2	55
BENZOTRIAZOLE	27556-51-0	24
BENZOYL CHLORIDE	98-88-4	24
BENZYL ACETATE	140-11-4	48
BENZYL CHLORIDE	100-44-7	36
BERYLLIUM SULFATE TETRAHYDRATE	7787-56-6	24
2-BIPHENYLAMINE HYDROCHLORIDE	2185-92-4	48
1,3-BIS(TERT-BUTYLDIOXYISOPROPYL)BENZENE	2212-81-9	24
BIS T-BUTYLDIOXYISOPROPYLBENZENE	25155-25-3	24
BIS(2-CHLOROETHYL)ETHER	111-44-4	40
BIS(2-CHLORO-1-METHYLETHYL) ETHER	108-60-1	48
BIS(1,5-CYCLOOCTADIENE) NICKEL	1295-35-8	24
BIS(CYCLOPENTADIENYL)VANADIUM CHLORIDE	12083-48-6	24
BIS(2-ETHYLHEXYL)ISOPHTHALATE	137-89-3	24
N,N-BIS(2-HYDROXYETHYL)-PTOLUIDINE	3077-12-1	14
BISPHENOL A	80-05-7	48
BISPHENOL A DIGLYCIDYL ETHER	1675-54-3	36
(4,4'-BITHIAZOLE)-2,2'-DIAMINE	58139-59-6	24
BIUREA	110-21-4	24
BIUREA	110-21-4	36
BORIC ACID	10043-35-3	48
BROMOCHLOROACETALDEHYDE		24
BROMOCHLOROACETONITRILE		24
BROMOPICRIN	464-10-8	24
1-BROMO-2-PROPANOL	19686-73-8	24
1,3-BUTADIENE	106-99-0	14
1,3-BUTADIENE	106-99-0	24
1,3-BUTADIENE	106-99-0	36
1,3-BUTADIENE	106-99-0	40
1,4-BUTANEDIOL DIGLYCIDYL ETHER	2425-79-8	40
2-BUTANONE PEROXIDE	1338-23-4	36
2-(2-BUTOXYETHOXY)ETHYLTHIOCYANATE	112-56-1	24
BUTYLATED HYDROXYTOLUENE	128-37-0	48
BUTYL BENZYL PHTHALATE	85-68-7	48
TERT-BUTYL CHROMATE	1189-85-1	25
N-BUTYL GLYCIDYL ETHER	2426-08-6	25
T-BUTYL GLYCIDYL ETHER	7665-72-7	25
N-BUTYL NITRITE	544-16-1	14
N-BUTYL NITRITE	544-16-1	16
SEC-BUTYL NITRITE	924-43-6	14
TERT-BUTYL PERBENZOATE	614-45-9	36
T-BUTYL PHENYL GLYCIDYL ETHER	3101-60-8	25
BUTYRIC ACID	107-92-6	25
GAMMA-BUTYROLACTONE	96-48-0	36

CHEMICAL	CAS NO.	PAGE
CADMIUM CHLORIDE	10108-64-2	48
CAFFEIC ACID	331-39-5	14
CAFFEINE	58-08-2	76
CALCIUM CHROMATE	13765-19-0	36
CALCIUM CHROMATE	13765-19-0	48
CALCIUM NAPHTHENATE	61789-36-4	14
CARBARSONE	121-59-5	25
4-(3-CARBAZOL-3-YL-AMINO)PHENOL	86-72-6	25
CARBON DISULFIDE	75-15-0	36
CARBON TETRACHLORIDE	56-23-0	119
CARBON TETRACHLORIDE	56-23-5	25
CARBROMAL	77-65-6	36
CARISOPRODOL	78-44-4	36
CARMINIC ACID	1260-17-9	14
CARMINIC ACID	1260-17-9	16
CARMINIC ACID	1260-17-9	25
CHAVICOL	501-92-8	14
CHEMICAL PROMUTAGENS		20
CHLORAL HYDRATE	302-17-0	36
CHLORAMBEN	133-90-4	36
CHLORAMBUCIL	305-03-3	36
CHLORAMPHENICOL SODIUM SUCCINATE	982-57-0	40
CHLORDANE	12789-03-6	36
CHLORDANE (TECHNICAL GRADE)	12789-03-6	48
CHLORENDIC ACID	115-28-6	36
CHLORINATED TRISODIUM PHOSPHATE	56802-99-4	36
CHLORINE (CHLORINATED DRINKING WATER)	7990-92-3	119
4-(CHLOROACETYL)ACETANILIDE	140-49-8	25
4-(CHLOROACETYL-ACETANILIDE	140-49-8	36
N-(3-CHLOROALLYL)HEXAMINIUM CHLORIDE	4080-31-3	25
P-CHLOROANILINE	106-47-8	48
CHLOROBENZENE	108-90-7	36
CHLOROBENZILATE	510-15-6	48
4-CHLORO-2-(2,4-DINITROANILINO)PHENOL	6358-18-5	25
2-CHLOROETHYLTRIMETHYLAMMONIUM CHLORIDE	999-81-5	36
CHLOROGENIC ACID	327-97-1	14
3-CHLORO-2-METHYLPROPENE	563-47-3	36
3-CHLOROMETHYLPYRIDINE HYDROCHLORIDE	6959-48-4	48
CHLORONEB	2675-77-6	25
4-CHLORO-2-NITROANILINE	89-63-4	48
1-CHLORO-1-NITROPROPANE	600-25-9	25
2-CHLORO-2-NITROPROPANE	594-71-8	25
CHLOROPRENE	126-99-8	36
2-CHLORO-1,3-PROPANEDIOL	497-04-1	25
1-CHLORO-2-PROPANOL	127-00-4	25
1-CHLORO-2-PROPANOL	127-00-4	40
2-CHLORO-1-PROPANOL	78-89-7	25
3-CHLORO-1-PROPANOL	627-30-5	25

CHEMICAL	CAS NO.	PAGE
5-CHLOROPYRIMIDINES		20
O-CHLOROSTYRENE	2039-87-4	25
CHLOROTHALONIL	1897-45-6	48
CHLOROTHIAZIDE	58-94-6	25
CHLOROTHIOFORMIC ACID	EMTDP-49	25
5-CHLORO-O-TOLUIDINE	95-79-4	48
P-CHLORO-ALPA,ALPHA,ALPHA-TRIFLUOROTOLUENE	98-56-6	14
P-CHLORO-ALPHA,ALPHA,ALPHATRIFLUOROTOLUENE	98-56-6	16
CHLORPHENIRAMINE MALEATE	113-92-8	48
CHLORPHENIRAMINE MALEATE	113-92-8	36
CHLORPROPAMIDE	94-20-2	36
CHOLESTEROL-5-ALPHA,6-ALPHA-EPOXIDE	1250-95-9	14
CHOLESTYRAMINE	11041-12-6	14
CHOLESTYRAMINE	11041-12-6	16
CHROMIUM CARBONYL	13007-92-6	36
CHROMIUM CARBONYL	13007-92-6	25
CHROMIUM HEXACARBONYL	13007-92-6	14
C.I. ACID BASIC RED 18	14097-03-1	16
C.I. ACID BLUE 74	860-22-0	14
C.I. ACID ORANGE 10	1936-15-8	14
C.I. ACID RED 14	3567-69-9	36
C.I. ACID YELLOW 151	12715-61-6	16
C.I. ACID YELLOW 151	12715-61-6	14
C.I. BASIC ORANGE 2	532-82-1	40
C.I. BASIC RED 18	14097-03-1	14
C.I. DIRECT BLACK 114	61703-05-7	25
C.I. DIRECT ORANGE 6	6637-88-3	25
C.I. DIRECT RED 80	2610-10-8	14
C.I. DIRECT RED 80	2610-10-8	16
C.I. DIRECT YELLOW 4	91-34-9	14
C.I. DIRECT YELLOW 4	91-34-9	16
C.I. DISPERSE BLUE 27	15791-78-3	25
C.I. DISPERSE BROWN 1	23355-64-8	14
C.I. DISPERSE BROWN 1	23355-64-8	16
C.I. PIGMENT ORANGE 7	5850-81-7	25
C.I. PIGMENT RED 2	6041-94-7	25
C.I. PIGMENT RED 8	6410-30-6	25
C.I. PIGMENT RED 69	5850-90-8	25
C.I. SOLVENT ORANGE 7	3118-97-6	14
C.I. SOLVENT YELLOW 5	85-84-7	14
CINNAMALDEHYDE ETHYLENE GLYCOL ACETAL	5660-60-6	25
CLONITRALID	1420-04-8	25
COAGULANTS, COAGULANT AIDS		119
COAL COMBUSTION PRODUCTS		117
COAL GASIFICATION MATERIALS		117
COAL LIQUEFACTION MATERIALS		117
COAL LIQUEFACTION MATERIALS		117
COAL LIQUEFACTION MATERIALS		117

CHEMICAL	CAS NO.	PAGE
COAL TAR		120
COBALT NAPHTHENATE	61789-51-3	14
COBALTOCENE	1277-43-6	25
COCONUT DIETHANOLAMIDE	68603-42-9	48
COPPER NAPHTHENATE	1338-02-9	14
COUMAPHOS	56-72-4	25
COUMAPHOS	56-72-4	36
COUMAPHOS	56-72-4	48
M-CRESIDINE	102-50-1	25
P-CRESIDINE	120-71-8	26
O-CRESYL GLYCIDYL ETHER	2210-79-9	26
4-CUMYLPHENYLDIPHENYL PHOSPHATE (CPDPP MIXED ISOMERS)	50851-28-0	26
P-CUMYL PHENYL GLYCIDYL ETHER	61578-04-9	26
CYANIDE		78
1,2-CYCLOHEXANEDICARBOXYLIC ACID, BIS(OXIRANYL-METHYL) ESTER	5493-45-8	26
CYCLOHEXIMIDE	66-81-9	26
CYCLOPHOSPHAMIDE	50-18-0	36
CYCLOPHOSPHAMIDE	50-18-0	88
CYCLOSPORIN A	59865-13-3	36
CYCLOSPORIN A	59865-13-3	26
L-CYSTEINE	52-90-4	14
L-CYSTEINE	52-90-4	16
CYTARABINE	147-94-4	26
CYTEMBENA	21739-91-3	26
D AND C YELLOW NO. 11	8003-22-3	26
DECABROMODIPHENYL OXIDE	1163-19-5	36
DECANOIC ACID	334-48-5	26
DEHYDROEMETINE HYDROCHLORIDE	4914-30-1	26
N-(DEOXYGUANOSINE-8-YL)-1-AMINOPYRENE		56
3-DEUTERO-6-AMINOBENZO(A)PYRENE		56
3-DEUTERO-6-METHYLBENZO(A)PYRENE		56
DEUTERO-6-NITROBENZO(A)PYRENE		57
N,N-DIACETYL-4-AMINOBENZO(A)PYRENE	82507-24-2	57
DIALLYL PHTHALATE	131-17-9	48
2,4-DIAMINOANISOLE SULFATE	39156-41-7	26
3,4-DIAMINOTOLUENE	496-72-0	26
DIARYLANILIDE YELLOW	6358-85-6	36
DIAZINON	333-41-5	36
DIAZINON	333-41-5	48
DIBROMOACETALDEHYDE	3039-13-2	26
2,3-DIBROMO-2-BUTENE-1,4-DIOL	3234-02-4	40
1,2-DIBROMO-3-CHLOROPROPANE	96-12-8	37
1,2-DIBROMO-4-(1,2-DIBROMOETHYL)CYCLOHEXANE	3322-93-8	37
DIBROMOETHANE	106-93-4	57
DIBROMOMANNITOL	488-41-5	37
1,3-DI((N-(4,6-DIMETHYL-2-PYRIMIDINYL)-4-SULFAMOYLPHENYL))-DI-SEC-BUTANOLAMINE		57

STUDY TYPE INDEX

MUTAGENESIS/GENETIC TOXICITY

CHEMICAL	CAS NO.	PAGE
DI-SEC-BUTANOLAMINE	21838-75-5	26
N,N'-DI-SEC-BUTYL-P-PHENYLDIAMINE	101-96-2	28
DIBUTYL PHENYL PHOSPHATE	2528-36-1	26
DIBUTYLTIN DIACETATE	1067-33-0	37
DIBUTYLTIN DIACETATE	1067-33-0	48
DICHLORAN	99-30-9	26
DICHLORAN	99-30-9	40
DICHLOROACETALDEHYDE	79-02-7	26
DICHLOROACETONITRILE	3018-12-0	37
P-DICHLOROBENZENE	106-46-7	48
5,6-DICHLORO-2-BENZOTHIAZOLAMINE	24072-75-1	26
DICHLORODIPHENYLETHYLENE	72-55-9	48
CIS-1,2-DICHLOROETHYLENE	156-59-2	26
DICHLOROMETHANE (METHYLENE CHLORIDE)	75-09-2	48
4,5-DICHLORO-6-METHYL-2-METHYLSULFONYL-PYRIMIDINE	17901-16-5	26
2,3-DICHLORONITROBENZENE	3209-22-1	37
2,4-DICHLORONITROBENZENE	611-06-3	37
3,4-DICHLORONITROBENZENE	99-54-7	37
1,3-DICHLORO-2-PROPANOL	96-23-1	26
1,3-DICHLOROPROPENE (TELONE II)	542-75-6	37
2,3-DICHLOROPROPYLENE	78-88-6	26
DICHLORVOS	62-73-7	26
N,N'-DICYCLOHEXYLTHIOUREA	1212-29-9	48
DIELDRIN	60-57-1	37
DIETHANOLAMINE	111-42-2	37
DIETHANOLAMINE	111-42-2	48
5-DIETHYLAMINO-2-NITROSO-4-METHYLPHENOL	6265-09-4	26
5-DIETHYLAMINO-2-NITROSOPHENYL HCL	25953-06-4	26
3-DIETHYLAMINOPHENOL	91-68-9	26
N,N'-DIETHYLCARBANILIDE	85-98-3	26
DIETHYLDICHLOROSILANE	1719-53-5	26
DIETHYLENE GLYCOL BIS-GLYCIDYL ETHER	4206-61-5	26
DI(2-ETHYLHEX-YL)ADIPATE	103-23-1	48
2,2'-DIETHYLHEXYLAMINE	106-20-7	26
N,N-DIETHYL-4-((5-NITRO-2THIAZOLYL)AZO) BENZENAMINE	54289-46-2	26
N,N-DIETHYL-P-PHENYLENEDIAMINE	93-05-0	26
N,N'-DIETHYLTHIOUREA	105-55-5	48
DIGITONIN	11024-24-1	26
DIGLYCIDYL RESORCINOL ETHER	101-90-6	48
3,3'-DIHYDROXYBENZIDINE	2373-98-0	27
1,8-DIHYDROXY-4,5-DINITROANTHRAQUINONE	81-55-0	40
1,8-DIHYDROXY-4,5-DINITROANTHRAQUINONE	81-55-0	37
DIHYDROXYUREA	686-68-0	27
DI(ISOPROPYLPHENYL)PHENYL PHOSPHATE (DIPP)	28109-00-4	27
2,3-DIMETHOXYANILINE HYDROCHLORIDE	54150-69-5	27
2,4-DIMETHOXYANILINE HYDROCHLORIDE	54150-69-5	37
2,4-DIMETHOXYANILINE HYDROCHLORIDE	54150-69-5	48

CHEMICAL	CAS NO.	PAGE
4,4'-DIMETHOXYDIPHENYLAMINE	101-70-2	27
4-DIMETHYLAMINOAZOBENZENE	60-11-7	27
2-(DIMETHYLAMINOETHYLAMINO)PYRIDINE	23826-72-4	57
3-DIMETHYLAMINO-4-METHYLPHENOL	119-31-3	27
5-DIMETHYLAMINO-2-NITROSO-4-METHYLPHENOL	6265-11-8	27
P-N,N-DIMETHYLAMINOPHENETHANOL	50438-75-0	14
N,N-DIMETHYLANILINE	121-69-7	37
DIMETHYLBENZANTHRACENE	57-97-6	57
3,3'-DIMETHYLBENZIDINE DIHYDROCHLORIDE	612-82-8	27
TRANS-1,3-DIMETHYLCYCLOPENTANE	1759-58-6	27
DIMETHYLETHANOLAMINE	108-01-0	40
DIMETHYLFORMAMIDE	68-12-2	37
1,1-DIMETHYL-1-(2-HYDROXYPROPYLAMINE) TETRADECANIMIDE	38848-76-9	27
DIMETHYL METHYLPHOSPHONATE	756-79-6	40
DIMETHYL MORPHOLINOPHOSPHORAMIDATE	597-25-1	40
1,2-DIMETHYL-3-NITROBENZENE	83-41-0	27
1,2-DIMETHYL-4-NITROBENZENE	99-51-4	27
1,3-DIMETHYL-2-NITROBENZENE	81-20-9	27
1,3-DIMETHYL-4-NITROBENZENE	89-87-2	27
1,3-DIMETHYL-5-NITROBENZENE	99-12-7	27
1,4-DIMETHYL-2-NITROBENZENE	89-58-7	27
DIMETHYLNITROSAMINE	62-75-9	57
DIMETHYLOLDIHYDROXYETHYLENEUREA	1854-26-8	40
N,N-DIMETHYL-P-PHENYLENEDIAMINE	93-98-9	27
DIMETHYL SULFOXIDE	67-68-5	27
DIMETHYL TEREPHTHALATE	120-61-6	37
N,N-DIMETHYL-P-TOLUIDINE	99-97-8	14
DIMETHYLVINYL CHLORIDE	513-37-1	40
N,N'-DI-2-NAPTHYL-P-PHENYLENEDIAMINE	93-46-9	27
2,4-DINITROANILINE	97-02-9	37
2,4-DINITROANILINE	97-02-9	27
2-(2,4-DINITROANILINO)PHENOL	6358-23-2	27
2,5-DINITRO-9H-FLUORENE	15110-74-4	27
2,7-DINITRO-9H-FLUOREN-9-ONE	31551-45-8	37
2,7-DINITRO-9H-FLUOREN-9-ONE	31551-45-8	27
2,4-DINITRO-6-(1-METHYLHEPTYL)-PHENOL	3687-22-7	27
1,3-DINITRONAPHTHALENE	606-37-1	27
1,5-DINITRONAPHTHALENE	605-71-0	27
1,8-DINITRONAPHTHALENE	602-38-0	27
2,4-DINITROPHENOL	51-28-5	27
1,3-DINITROPYRENE	75321-20-9	57
1,6-DINITROPYRENE	42397-64-8	58
1,8-DINITROPYRENE	42397-65-9	58
(3H)-1,3-DINITROPYRENE		58
(3H)-1,6-DINITROPYRENE		58
(3H)-1,8-DINITROPYRENE		58
2,4-DINITROTOLUENE	121-14-2	37

MUTAGENESIS/GENETIC TOXICITY

STUDY TYPE INDEX

CHEMICAL	CAS NO.	PAGE
4,4'-DIOCTYLDIPHENYLAMINE	101-67-7	27
1,4-DIOXANE	123-91-1	49
DIPHENHYDRAMINE HYDROCHLORIDE	147-24-0	37
DIPHENHYDRAMINE HYDROCHLORIDE	147-24-0	49
1,3-DIPHENYLGUANIDINE	102-06-7	14
1,3-DIPHENYLGUANIDINE	102-06-7	16
N,N'-DIPHENYL-P-PHENYLENEDIAMINE	74-31-7	27
ASYM-DIPHENYLUREA	603-54-3	28
1,3-DI(4-SULFAMOYLPHENYL)TRIAZINE		58
N-DODECYLMERCAPTAN	112-55-0	16
N-DODECYLMERCAPTAN	112-55-0	14
DRINKING WATER CONTAMINANTS		120
ECONAZOLE	27220-47-9	28
ELLAGIC ACID DIHYDRATE	476-66-4	14
ELLAGIC ACID DIHYDRATE	476-66-4	16
ENDRIN	72-20-8	49
ENDRIN	72-20-8	37
EPHEDRINE SULFATE	134-72-5	37
EPHEDRINE SULFATE	134-72-5	49
EPIBROMOHYDRIN	3132-64-7	40
EPINEPHRINE	51-43-4	28
1,2-EPOXYBUTANE	106-88-7	49
2,3-EPOXYBUTANE	3266-23-7	28
1,2-EPOXY-3-BUTENE	930-22-3	28
1,2-EPOXYDECANE	2404-44-6	28
2,3-EPOXY-1,4-DICHLOROBUTANE	3583-47-9	28
2,3-EPOXY-2,3-DIMETHYLBUTANE	5076-20-0	28
1,2-EPOXYDODECANE	2855-19-8	28
1,2-EPOXY-3-FLUOROPROPANE	503-09-3	28
1,2-EPOXYHEXADECANE	7320-37-8	37
1,2-EPOXYHEXADECANE	7320-37-8	49
1,2-EPOXY-1,1,2,3,3,3-HEXAFLUOROPROPANE	428-59-1	28
1,2-EPOXYOCTADECANE	7390-81-0	28
9,10-EPOXYOCTADECANOIC ACID, 2-ETHYLHEXYL ESTER	141-38-8	28
1,2-EPOXYTETRADECANE	3234-28-4	28
1,2-EPOXY-3,3,3-TRICHLOROPROPANE	3083-23-6	37
ERYTHROMYCIN STEARATE	643-22-1	37
ERYTHROMYCIN STEARATE	643-22-1	49
ETHINYLESTRADIOL	57-63-6	28
ETHIONAMIDE	536-33-4	28
2-ETHOXYETHANOL (EGMEE)	110-80-5	49
N-(3-ETHOXYPHENYL)ACETAMIDE	591-33-3	28
ETHYL ACETATE	141-78-6	28
ETHYL BROMIDE	74-96-4	37
ETHYL CHLORIDE	75-00-3	28
S-(ETHYL)CHLOROTHIOFORMIC ACID	2941-64-2	28
1-ETHYL-4-(DIETHYLDIAMINE)PIPERAZINE	EMTDP-59	28
N-ETHYL-N,N-DIPHENYLUREA	18168-01-9	28

CHEMICAL	CAS NO.	PAGE
S-ETHYL DIPROPYLTHIOCARBAMATE	759-94-4	28
ETHYLENEDIAMINE TETRAACETIC ACID (EDTA)	150-38-9	37
ETHYLENEDIAMINE TETRAACETIC ACID (EDTA)	150-38-9	49
ETHYLENE GLYCOL	107-21-1	37
ETHYLENE OXIDE	75-21-8	28
ETHYLENE OXIDE	75-21-8	37
N-ETHYLENE-TETRAETHYLPENTAMINE	ENTDP-57	28
ETHYLENE THIOUREA	96-45-7	40
ETHYLENE THIOUREA	96-45-7	49
2-ETHYLHEXANAL	123-05-7	28
2-ETHYLHEXANOIC ACID	149-57-5	37
2-ETHYLHEXANOL	104-76-7	37
2-ETHYLHEXENAL	26266-68-2	28
2-ETHYL-2-HEXENAL	645-62-5	28
2-ETHYLHEXYLAMINE	104-75-6	28
2-ETHYLHEXYL GLYCIDYL ETHER	2461-15-6	28
3-((ETHYLHEXYL)OXY)PROPIONITRILE	10213-75-9	28
3-((ETHYLHEXYL)OXY)PROPYLAMINE	5397-31-9	28
ETHYLHYDROXY HEXANOIC ACID	29671-57-6	28
ETHYL METHANESULFONATE	65-50-0	58
N-ETHYL-4-NITROANILINE	3665-80-3	28
ETHYLNITROSOUREA	759-73-9	21
ETHYLNITROSOUREA	759-73-9	118
N-ETHYL-O-TOLUENESULFONAMIDE	1077-56-1	28
EUGENOL	97-53-0	40
EXTRACTS FROM WORKPLACE SAMPLES		67
FD AND C RED NO. 32	3118-97-6	28
FD AND C YELLOW NO. 6	2783-94-0	28
FENDILINE	13042-18-7	28
FERRIC AMMONIUM FERROCYANIDE	25869-00-5	29
FERRIC AMMONIUM FERROCYANIDE	25869-00-5	37
FERRIC CHLORIDE	7705-08-0	49
FERROCENE	102-54-5	14
FLUOMETURON	2164-17-2	49
FLY ASH ASSOCIATED HYDROCARBONS		118
FORMANILIDE	103-70-8	29
FURAN	110-00-9	37
FURAN	110-00-9	40
FURAN	110-00-9	49
FUROSEMIDE	54-31-9	49
GLUTATHIONE, OXIDIZED	27025-41-8	14
GLUTATHIONE, OXIDIZED	27025-41-8	16
GLUTATHIONE, REDUCED	70-18-8	14
GLUTATHIONE, REDUCED	70-18-8	16
GLYCIDOL	556-52-5	40
GLYCIDYL ACRYLATE	106-90-1	29
GLYCIDYL METHACRYLATE	106-91-2	29
GRISEOFULVIN	126-07-8	29

MUTAGENESIS/GENETIC TOXICITY

STUDY TYPE INDEX

CHEMICAL	CAS NO.	PAGE
HALOACETONITRILES		120
HALO ALKYL PHOSPHATES		20
HC BLUE 2	33229-34-4	49
HC-BLUE-NO. 1	2784-94-3	59
HC YELLOW 4	52551-67-4	38
HEAT STABLE TOXIN OF E. COLI		52
HEAVY METALS		20
HEAVY METALS		20
HEAVY METALS		20
HEPTACHLOR	76-44-8	49
HEPTADECYLHYDROXYETHYLIMIDAZOLINE	95-19-2	16
HEPTADECYLHYDROXYETHYLIMIDAZOLINE	95-19-2	15
1,2,3,4,6,7-HEXABROMONAPHTHALENE	75625-24-0	29
HEXACHLOROBENZENE	118-74-1	38
HEXACHLOROCYCLOPENTADIENE	77-47-4	38
1,2,3,6,7,8-HEXACHLORODIBENZO-P-DIOXIN	57653-85-7	29
HEXACHLOROETHANE	67-72-1	49
HEXACHLORONAPHTHALENE	1335-87-1	29
1,1,1,3,3,3-HEXAFLUORO-2PROPANOL	920-66-1	29
HEXAMETHYL-P-ROSANILINE CHLORIDE	548-62-9	40
1,3,6-HEXANETRICARBONITRILE	1772-25-4	29
HEXYL GLYCIDYL ETHER	5926-90-9	29
HUMIC ACID	1415-93-6	120
HYCANTHONE METHANESULFONATE	23255-93-8	29
HYDROCYANIC ACID	74-90-8	29
HYDROQUINONE	123-31-9	40
N-HYDROXY-AMINOFLUORENE	53-94-1	60
N-(HYDROXYETHYL)ETHYLENEDIAMINE	111-41-1	40
HYDROXYLAMINE, HYDROCHLORIDE	5470-11-1	29
2-HYDROXY-1,4-NAPHTHOQUINONE	83-72-7	40
N-HYDROXYPHENACETIN	19315-64-1	60
N-HYDROXY-P-PHENETIDINE	19315-64-1	60
8-HYDROXYQUINOLINE SULFATE	134-31-6	29
IODACETIC ACID	64-69-7	29
IODOCHLOROHYDROXYQUINOLINE	130-26-7	29
IRON DEXTRAN	9004-66-4	49
ISATIN-5-SULFONIC ACID SODIUM SALT	80789-74-8	40
ISOAMYL NITRITE	110-46-3	15
ISOBUTYL ALCOHOL	78-83-1	29
ISOBUTYL NITRITE	542-56-3	15
ISOBUTYRALDEHYDE	78-84-2	49
ISODECYL METHACRYLATE	29964-84-9	29
ISOEUGENOL	97-54-1	15
ISOEUGENOL	97-54-1	16
ISOPHTHALIC DIGLYCIDYL ESTER	67846-32-6	29
ISOPRENE	78-79-5	38
ISOPRENE	78-79-5	40
P-ISOPROPOXYDIPHENYLAMINE	101-73-5	29

CHEMICAL	CAS NO.	PAGE
2-ISOPROPOXYPHENYL-N-METHYLCARBAMATE	114-26-1	16
2-ISOPROPOXYPHENYL-N-METHYLCARBAMATE	114-26-1	15
N-ISOPROPYLANILINE	768-52-5	29
ISOPROPYL GLYCIDYL ETHER	4016-14-2	40
LANTHANUM NITRATE HEXAHYDRATE	10277-43-7	29
LAPACHOL	84-79-7	16
LASIOCARPINE	303-34-4	38
LAURIC ACID	143-07-7	29
LAURIC ACID DIETHANOLAMINE CONDENSATE	120-40-1	49
LAURYL GLYCIDYL ETHER	2461-18-9	29
LEAD NAPHTHENATE	61790-14-5	15
LEVCO VAT BLUE 1	6537-68-4	29
D-LIMONENE	5989-27-5	38
D-LIMONENE	5989-27-5	49
LIPID EPOXIDES		20
LITHOCHOLIC ACID	434-13-9	29
LUMINOL	521-31-3	29
MALAOXON	1634-78-2	29
MALATHION	121-75-5	49
MALONALDEHYDE, SODIUM SALT	24382-04-5	38
MALTOL	118-71-8	40
MANGANESE NAPHTHENATE	1336-93-2	15
D-MANNITOL	69-65-8	49
MELAMINE	108-78-1	49
DL-MENTHOL	15356-70-4	29
2-MERCAPTOBENZIMIDAZOLE	583-39-1	49
2-MERCAPTOBENZIMIDAZOLE	583-39-1	38
MERCAPTOBENZOTHIAZOLE	149-30-4	49
2-MERCAPTO-4-METHYL-5THIAZOLYL METHYL KETONE	7725-93-1	29
MERCURIC CHLORIDE	7487-94-7	40
MERCURIC CHLORIDE	7487-94-7	49
METHACRYLONITRILE	126-98-7	40
METHAPYRILENE HYDROCHLORIDE	135-23-9	49
4-(METHODYBENZILIDINE-4'BUTYLANILINE (MBBA)	26227-73-6	29
2-(P-METHOXYBENZYLAMINO)-PYRIDINE		60
3-((METHOXYCARBONYL)AMINO)PHENYL N-(3-METHYLPHENYL) CARBAMATE	13684-63-4	29
METHOXYETHYL MERCURY CHLORIDE	123-88-6	30
METHOXYFLURANE	76-38-0	30
3-METHYLADENINE	5142-23-4	60
7-METHYLADENINE	935-69-3	61
3-METHYLAMINO-4-METHYLPHENOL	6265-13-0	30
1-METHYLBENZ(A)ANTHRACENE	2498-77-3	61
METHYL-2 BENZIMIDAZOLE CARBAMATE	METHYL-2B	30
6-METHYLBENZO(A)PYRENE	2381-39-7	61
7-METHYLBENZO(A)PYRENE	63041-77-0	61
10-METHYLBENZO(A)PYRENE	63104-32-5	61
4-(6-METHYL-2-BENZOTHIAZOYL)BENZENAMINE	92-36-4	30

MUTAGENESIS/GENETIC TOXICITY

CHEMICAL	CAS NO.	PAGE
ALPHA-METHYLBENZYL ALCOHOL	98-85-1	38
ALPHA-METHYLBENZYL ALCOHOL	98-85-1	49
METHYL BROMIDE	74-83-9	30
METHYL CARBAMATE	598-55-0	49
METHYL CARBAMATE	598-55-0	40
METHYL DEMETON	8022-00-2	30
N'-METHYL-N,N-DIPHENYLUREA	13114-72-2	30
METHYLDOPA	555-30-6	38
METHYLDOPA	555-30-6	49
METHYLENEBIS(4-CYCLOHEXYL ISOCYANATE)	5124-30-1	30
2,2'-METHYLENE BIS(PHENYLENEOXYMETHYLENE)BISOXIRANE	39817-09-9	30
METHYLENE BIS(THIOCYANATE)	6317-18-6	30
METHYLENEDIANILINE	101-77-9	30
METHYLETHYL KETONE	78-93-3	30
METHYL FLUOROSULFONATE	421-20-5	15
METHYLGLUTARONITRILE	4553-62-2	30
METHYL GLYCIDYL ETHER	930-37-0	30
METHYL MERCURIC CHLORIDE	115-09-3	30
METHYL MERCURY HYDROXIDE	1184-57-2	30
METHYL METHANESULFONATE	66-27-3	62
2-METHYL-3-NITROANILINE	603-83-8	30
2-METHYL-4-NITROANILINE	99-52-5	30
2-METHYL-6-NITROANILINE	570-24-1	30
4-METHYL-2-NITROANILINE	89-62-3	30
4-METHYL-3-NITROANILINE	119-32-4	30
5-METHYL-2-NITROANILINE	578-46-1	30
N-METHYL-4-NITROANILINE	100-15-2	30
2-METHYL-3-NITRO-BENZOIC ACID	1975-50-4	30
2-METHYL-5-NITRO-BENZOIC ACID	1975-52-6	30
2-METHYL-6-NITRO BENZOIC ACID	13506-76-8	30
3-METHYL-2-NITRO-BENZOIC ACID	5437-38-7	30
3-METHYL-4-NITRO-BENZOIC ACID	3113-71-1	30
4-METHYL-3-NITRO-BENZOIC ACID	96-98-0	30
5-METHYL-2-NITRO-BENZOIC ACID	3113-72-2	30
METHYLTIN-TRIS(ISOOCTYLMERCAPTOACETATE)	54849-38-6	30
METHYL TRIFLUOROMETHANESULFONATE	333-27-7	30
METHYL VIOLOGEN	1910-42-5	49
METRONIDAZOLE	443-48-1	30
MEXACARBATE	315-18-4	30
MICHLER'S KETONE	90-94-8	30
MOLYBDENUM TRIOXIDE	1313-27-5	31
MOLYBDENUM TRIOXIDE	1313-27-5	49
MONOCHLOROACETIC ACID	79-11-8	40
MONO(2-ETHYLHEXYL)ADIPATE	4337-65-9	49
MONOISOPROPANOLAMINE	78-96-6	40
MONOSODIUM GLUTAMATE	142-47-2	31
NALIDIXIC ACID	389-08-2	38
4-(2-NAPHTHYLAMINO)PHENOL	93-45-8	31

CHEMICAL	CAS NO.	PAGE
ALPHA-NAPHTHYL ISOTHIOCYANATE	551-06-4	31
2-NAPHTHYL LACTATE	93-43-6	31
NEODECANOIC ACID, 2,3-EPOXYPROPYL ESTER	26761-45-5	31
NEOPENTYL GLYCOL DIGLYCIDYL ETHER	17557-23-2	31
NICKEL CARBONYL	13463-39-3	31
NICKEL SULFATE HEXAHYDRATE	10101-97-0	49
NIFEDIPINE	21829-25-4	31
NITRILES		78
NITRITES		78
9-NITROANTHRACENE	602-60-8	31
9-NITROANTHRACENE	602-60-8	38
4-NITROANTHRANILIC ACID	619-17-0	38
NITROARENES		20
4-NITRO-1,3-BENZENEDIAMINE	5131-58-8	31
O-NITROBENZOIC ACID	552-16-9	31
6-NITROBENZO(A)PYRENE	63041-90-7	62
O-NITROBENZOYL CHLORIDE	610-14-0	31
P-NITROBENZOYL CHLORIDE	122-04-3	38
M-NITROBENZYL CHLORIDE	619-23-8	31
2-NITRO-1-BUTANOL	609-31-4	31
2-NITRODIPHENYLAMINE	119-75-5	31
2-NITROETHANOL	625-48-9	31
3-NITRO-9-FLUORENONE	42135-22-8	31
3-NITRO-9-FLUORENONE	42135-22-8	38
NITROFURANTOIN	67-20-9	50
NITROFURAZONE	59-87-0	38
1-NITRO-2-METHYLNAPHTHALENE	881-03-8	31
O-NITROPHENETHYLALCOHOL, ACETATE	833-43-2	31
P-NITROPHENETHYLALCOHOL, ACETATE	104-30-3	31
P-NITROPHENOL	100-02-7	38
1-(4-NITROPHENYL)-2-CHLOROPROPANE	34197-98-3	31
2-NITRO-P-PHENYLENEDIAMINE	5307-14-2	31
4-NITRO-O-PHENYLENEDIAMINE	99-56-9	38
4-NITROPHTHALIC ANHYDRIDE	5466-84-2	31
3-NITROPROPIONIC ACID	504-88-1	31
NITROPRUSSIDE	15078-28-1	78
1-NITROPYRENE	5522-43-0	31
1-NITROPYRENE	5522-43-0	63
(3H)-1-NITROPYRENE		63
NITROPYRENES		20
1-NITROSO-1-(2-CHLOROETHYL)-3-(2-HYDROXYETHYL)-UREA		3
1-NITROSO-1-(2-CHLOROETHYL)-3-(2-HYDROXYPROPYL)-UREA		3
N-NITROSODIETHYLAMINE	55-18-5	31
N-NITROSODIPHENYLAMINE	86-30-6	31
1-NITROSO-1-ETHYL-3-(2-HYDROXYETHYL)-UREA		3
N-NITROSO-N-ETHYLURETHANE	614-95-9	31
1-NITROSO-1-(2-HYDROXYETHYL)-3-(2-CHLOROETHYL)-UREA		4
1-NITROSO-1-(2-HYDROXYETHYL)-3--ETHYLUREA		4

CHEMICAL	CAS NO.	PAGE
1-NITROSO-1-(2-HYDROXYPROPYL)-3-(2-CHLOROETHYL)-UREA		4
4-NITROSOPHENOL	104-91-6	31
1-NITROSOPYRENE		63
BETA-NITROSTYRENE	102-96-5	31
P-NITROTOLUENE	99-99-0	50
5-NITRO-O-TOLUIDINE	99-55-8	31
NONAMETHYLENEIMINE	4396-27-4	31
NONYLPHENYL DIPHENYL PHOSPHATE (NPDPP MIXED ISOMERS)	64532-97-4	32
NORDIHYDRO-GUAIARETIC ACID	500-38-9	15
NORDIHYDRO-GUAIARETIC ACID	500-38-9	16
NOSCAPINE	128-62-1	32
NTA(NITRILOTRIACETIC ACID)	139-13-9	32
NTA(NITRILOTRIACETIC ACID)	139-13-9	38
NTA(NITRILOTRIACETIC ACID)	139-13-9	40
OCTACHLORONAPHTHALENE	2234-13-1	32
OCTAMETHYLCYCLOTETRASILOXANE	556-67-2	15
OCTAMETHYLTRISILOXANE	107-51-7	15
OCTANOIC ACID	124-07-2	32
2-OCTYL-3-ISOTHIAZOLONE	26530-20-1	32
P-N-OCTYLOXYBENZOIC ACID	2493-84-7	32
OIL SHALE		118
OLEIC ACID DIETHANOLAMINE	13961-86-9	32
OLEIC ACID DIETHANOLAMINE	13961-86-9	50
OLIVETOL	500-66-3	32
OXIDIZED LIPIDS		20
OXYTETRACYCLINE HYDROCHLORIDE	2058-46-0	40
OXYTETRACYCLINE HYDROCHLORIDE	2058-46-0	50
PENTACHLOROETHANE	76-01-7	50
PENTACHLORONITROBENZENE	82-68-8	50
PENTAETHYLENEHEXAMINE	4067-16-7	41
PENTAETHYLPENTAMINE	EMTDP-56	32
PENTAMETHYLPARAROSANILINE	603-47-4	63
1-PENTANOL	71-41-0	32
2-PENTENENITRILE	13284-42-9	32
3-PENTENENITRILE	4635-87-4	32
2-(P-PENTYLPHENYL)-5-(P-PENTYLOXYPHENYL) PYRIMID[illegible]	34913-07-0	32
PERCHLOROMETHYL MERCAPTAN	594-42-3	32
PHENANTHRENE	85-01-8	32
PHENAZOPYRIDINE HYDROCHLORIDE	136-40-3	50
PHENESTERIN	3546-10-9	41
PHENESTERIN	3546-10-9	50
M-PHENETIDINE	621-33-0	32
P-PHENETIDINE	156-43-4	32
PHENOL	108-95-2	50
O-PHENYLENEDIAMINE	95-54-5	32
M-PHENYLENEDIAMINE	108-45-2	32
P-PHENYLENEDIAMINE DIHYDROCHLORIDE	624-18-0	32

CHEMICAL	CAS NO.	PAGE
PHENYL GLYCIDYL ETHER	122-60-1	32
1-PHENYL-3-METHYL-5PYRAZOLONE	89-25-8	38
N-PHENYL-1-NAPHTHYLAMINE	90-30-2	32
N-PHENYL-P-PHENYLENEDIAMINE	101-54-2	38
PHENYLPHOSPHINE	638-21-1	32
1-PHENYL-2-THIOUREA	103-85-5	38
PHOTODIELDRIN	13366-73-9	38
PHTHALAMIDE	88-96-0	38
PHTHALAMIDE	88-96-0	50
PICRIC ACID	88-89-1	38
PICRYL CHLORIDE	88-88-0	32
POLYCYCLIC HYDROCARBONS		68
POLYETHYLPOTASSIUM 2-BENZYL-4-CHLOROPHENATE	35471-49-9	32
POLYNUCLEAR AROMATIC HYDROCARBONS		118
POLYTHIAZIDE	346-18-9	32
POTASSIUM P-TERT AMYLPHENATE	53404-18-5	32
POTASSIUM CHLORIDE	7447-40-7	50
POTASSIUM DICHROMATE	7778-50-9	32
PRIORITY AIR POLLUTANTS		121
PROCARBAZINE HYDROCHLORIDE	366-70-1	32
PROGESTERONE	57-83-0	32
2-PROPANOL, 1-CHLORO-, PHOSPHATE (3:1)	13674-84-5	32
S-(N-PROPYL)CHLOROTHIOFORMIC ACID	EMTDP-51	32
PROPYLENE	115-07-1	32
PROPYLENE CYANOHYDRIN	2567-01-3	32
PROPYLENE OXIDE	75-56-9	38
1,3-PROPYLENE OXIDE	503-30-0	38
N-PROPYL NITRITE	543-67-9	15
PYRAZINE	290-37-9	15
PYRENE	129-00-0	21
PYRENE	129-00-0	32
PYRILAMINE	91-84-9	64
QUESTRAN		15
QUESTRAN		16
QUINACRINE DIHYDROCHLORIDE	69-05-6	32
QUINACRINE MUSTARD	4213-45-[illegible]	32
QUINETHAZONE (AQUAMOX)	73-49-4	33
QUINOLINE	91-22-5	50
QUINOLINES		20
RESCINNAMINE	24815-24-5	33
RESERPINE	50-55-5	41
RESORCINOL	108-46-3	41
REXARSONE	121-19-7	41
RHODAMINE 6G	989-38-3	38
ROTENONE	83-79-4	38
ROTENONE	83-79-4	50
ROXARSONE	121-19-7	50
SAFFRON	11012-59-2	15

334<

STUDY TYPE INDEX

MUTAGENESIS/GENETIC TOXICITY

CHEMICAL	CAS NO.	PAGE
SAFFRON	11012-59-2	16
SAXITOXIN	35523-89-8	104
SCOPOLAMINE HYDROBROMIDE	114-49-8	33
SODIUM AZIDE	26628-22-8	21
SODIUM BISULFITE DIBENZO-P-DIOXIN	7631-90-5	21
SODIUM CHLORIDE	7647-14-5	33
SODIUM CHLORIDE	7647-14-5	38
SODIUM CYANURATE	2624-17-1	33
SODIUM DIETHYLDITHIOCARBAMATE	148-18-5	38
SODIUM DODECYL SULFATE	151-21-3	38
SODIUM DODECYL SULFATE	151-21-3	50
SODIUM FLUORIDE	7681-49-4	50
SODIUM IODOMETHANESULFONATE	126-31-8	33
SODIUM XYLENESULFONATE	1300-72-7	50
STANNOUS CHLORIDE	7772-99-8	50
STEARATOCHROMIC CHLORIDE COMPLEX	15242-96-3	33
STEVIOL	471-80-7	113
STYRENE	100-42-5	33
SUCCINIC ACID 2,2-DIMETHYLHYDRAZIDE	1596-84-5	50
SUCCINIC ANHYDRIDE	108-30-5	38
SUCROSE	57-50-1	50
SULFAMETHAZINE TRIAZENE		64
SULFAMETHIZOLE	144-82-1	15
SULFAMETHIZOLE	144-82-1	16
SULFANILAMIDE	63-74-1	15
SULFANILAMIDE	63-74-1	16
SULFATHIAZOLE	72-14-0	15
SULFATHIAZOLE	72-14-0	16
SULFISOXAZOLE	127-69-5	33
3-SULFOLENE	77-79-2	38
4,4'-SULFONYLDIANILINE	80-08-0	50
ALPHA-TERPINEOL	98-55-5	15
ALPHA-TERPINEOL	98-55-5	16
1,2,4,5-TETRABROMO-3,6-DIMETHYLBENZENE	23488-38-2	33
2,3,5,6-TETRACHLORO-4NITROANISOLE	2438-88-2	50
1,2,4,5-TETRACHLOROBENZENE	95-94-3	15
1,2,4,5-TETRACHLOROBENZENE	95-94-3	16
1,1,2,2-TETRACHLOROETHANE	79-34-5	50
TETRACHLOROETHYLENE	127-18-4	50
TETRACHLORONAPHTHALENE	1335-88-2	33
2,3,5,6-TETRACHLORO-4-NITROANISOLE	2438-88-2	33
2,3,5,6-TETRACHLORO-4-NITROANISOLE	2438-88-2	38
2,3,4,5-TETRACHLOROPHENOL	4901-51-3	33
2,3,4,6-TETRACHLOROPHENOL	58-90-2	33
2,3,5,6-TETRACHLOROPHENOL	935-95-5	33
TETRACHROMIC ACID, POTASSIUM ZINC SALT	12433-50-0	33
TETRACYCLINE HYDROCHLORIDE	64-75-5	38
TETRACYCLINE HYDROCHLORIDE	64-75-5	41
TETRADECANOIC ACID	544-63-8	33
TETRAETHYLENEPENTAMINE	112-57-2	41
TETRAFLUOROETHYLENE	116-14-3	33
TETRAKIS(HYDROXYMETHYL)PHOSPHONIUM CHLORIDE	124-64-1	38
TETRAKIS(HYDROXYMETHYL) PHOSPHONIUM SULFATE	55566-30-8	50
N,N,N',N'-TETRAMETHYLPARAROSANILINE		64
N,N,N',N',TETRAMETHYL-PPHENYLENEDIAMINE	100-22-1	33
1,3,6,8-TETRANITROPYRENE	28767-61-5	33
THIABENDAZOLE	148-79-8	33
THIAZOLE	288-47-1	33
THIOACETAMIDE	62-55-5	33
THIOPHANATE M	23564-05-8	33
THIOUREA	62-56-6	33
TITANIUM DIOXIDE	13463-67-7	33
TITANIUM DIOXIDE	13463-67-7	38
TITANIUM OXIDE	13463-67-7	50
D-ALPHA-TOCOPHEROL SUCCINATE	4345-03-3	33
TOLAZAMIDE	1156-19-0	33
TOLBUTAMIDE	64-77-7	38
O-TOLUALDEHYDE	529-20-4	33
TOLUENE	108-88-3	50
TOLUENE (NITRATION GRADE)	108-88-3	38
TOLUENE (TECHNICAL)	108-88-3	38
2,6-TOLUENEDIAMINE DIHYDROCHLORIDE	15481-70-6	33
2,6-TOLUENEDIAMINE DIHYDROCHLORIDE	15481-70-6	50
2,5-TOLUENEDIAMINE SULFATE	6369-59-1	33
2,5-TOLUENEDIAMINE SULFATE	6369-59-1	39
M-TOLUIDINE	108-44-1	33
M-TOLUIDINE HYDROCHLORIDE	638-03-9	34
P-TOLUNITRILE	104-85-8	34
TRIALLYL ISOCYANURATE	1025-15-6	34
TRIBENZYL ISOCYANURATE	606-03-1	34
TRIBROMOACETONITRILE		34
2,4,6-TRIBROMOPHENYL CARBONATE	67990-32-3	34
TRI-SEC-BUTANOLAMINE	2421-02-5	34
TRICHLORFON	52-68-6	39
TRICHLOROMELAMINE	7673-09-8	34
2,3,4-TRICHLORONITROBENZENE	17700-09-3	34
2,4,5-TRICHLORONITROBENZENE	89-69-0	34
2,4,6-TRICHLORONITROBENZENE	18708-70-8	34
3,4,6-TRICHLORO-2-NITROPHENOL	82-62-2	34
2,3,5-TRICHLOROPHENOL	933-78-8	34
2,3,6-TRICHLOROPHENOL	933-75-5	34
3,4,5-TRICHLOROPHENOL	609-19-8	34
2,3,4-TRICHLOROPHENYL	15950-66-0	34
TRIETHYLENE GLYCOL DIGLYCIDYL ETHER	1954-28-5	34
TRIETHYLENETETRAMINE	112-24-3	41
TRIFLUOROTHYMIDINE	70-00-8	34

CHEMICAL	CAS NO.	PAGE
TRIGONELLINE	535-83-1	15
1,8,9-TRIHYDROXYANTHRACENE	480-22-8	34
2,4,5-TRIMETHOXYBENZALDEHYDE	4460-86-0	39
2,4,5-TRIMETHOXYBENZALDEHYDE	4460-86-0	50
TRIMETHYL ISOCYANURATE	827-16-7	34
TRIMETHYLTHIOUREA	2489-77-2	39
TRIMETHYLTHIOUREA	2489-77-2	50
2,4,6-TRINITROANILINE	489-98-5	34
1,3,6-TRINITROPYRENE	75321-19-6	34
2,4,6-TRINITROTOLUENE	118-96-7	34
TRIPHENYL ANTIMONY	603-36-1	15
TRIPHENYLTIN HYDROXIDE	76-87-9	34
TRIPHENYLTIN HYDROXIDE	76-87-9	39
TRI-N-PROPYLAMINE	102-69-2	34
TRIS(CARBAMOYLMETHYL)ISOCYANURATE	1843-48-7	34
TRIS(3-CHLORO-2-HYDROXYPROPYL)ISOCYANURATE	7423-53-2	34
TRIS(2,3-EPOXYPROPYL)-ISOCYANURATE	2451-62-9	34
TRIS(2-ETHYLHEXYL)TRIMELLITATE	3319-31-1	34
1,3,5-TRIS(2-HYDROXYETHYL)TRIAZINE-2,4,6-TRIONE	839-90-7	34
TRIS(2-KETOPROPYL)ISOCYANURATE	61050-97-3	34
TRIS(TRIPHENYLSTANNYL)ISOCYANURATE	752-74-9	34
O-TRITOLYL PHOSPHATE	78-30-8	34
P-TRITOLYL PHOSPHATE	78-32-0	34
URETHANE	51-79-6	34
UROTROPINE	100-97-0	34
VALERONITRILE	110-59-8	34
VERAPAMIL	52-53-9	35
4-VINYLCYCLOHEXENE	100-40-3	39
4-VINYLCYCLOHEXENE	100-40-3	50
1-VINYL-4-(DIETHYLDIAMINE)PIPERAZINE	EMTDP-58	35
VINYLIDENE CHLORIDE (1,1DICHLOROETHYLENE	75-35-4	50
VINYLIDENE CHLORIDE (1,1-DICHLOROETHYLENE)	75-35-4	39
VINYLIDENE FLUORIDE	75-38-7	35
VINYLIDENE FLUORIDE	75-38-7	39
VINYL TOLUENE	25013-15-4	39
VITAMIN D	1406-16-2	35
WATER	7732-18-5	35
XYLENES, COMMERCIAL MIXTURE	1330-20-7	35
ZINC NAPHTHENATE	12001-85-3	15
ZIRCONOCENE DICHLORIDE	1291-32-3	35

336<

NUTRITIONAL STUDIES

STUDY TYPE INDEX

CHEMICAL	CAS NO.	PAGE
2-ACETYLAMINOFLUORENE	53-96-3	54
IRON	7439-89-6	90
MANGANESE	7439-96-5	52
VITAMIN E		52

NUTRITIONAL STUDIES/PHARMACOKINETICS/METABOLISM

CHEMICAL	CAS NO.	PAGE
CADMIUM	7440-43-9	51

OCULAR TOXICITY

CHEMICAL	CAS NO.	PAGE
2-ACETYLAMINOFLUORENE	53-96-3	54
CADMIUM	7440-43-9	51
IRON	7439-89-6	90
MANGANESE	7439-96-5	52
VITAMIN E		52

339<

ORGAN TOXICITY

CHEMICAL	CAS NO.	PAGE
AMINOGLYCOSIDE ANTIBIOTICS		88

340<

STUDY TYPE INDEX

PHARMACOKINETICS/METABOLISM

CHEMICAL	CAS NO.	PAGE
ACETAMINOPHEN	103-90-2	54
ACETAMINOPHEN	103-90-2	88
ACETOPHENETIDIN	62-44-2	85
N4-ACETYLSULFAMETHAZINE	100-90-3	54
ACRYLONITRILE	107-13-1	88
ACRYLONITRILE	107-13-1	88
ADRIAMYCIN	23214-92-8	86
ALIPHATIC NITRILES		78
6-AMINOBENZO(A)PYRENE	7428-83-3	54
6-AMINOBENZO(A)PYRENE	7428-83-3	54
AMINOGLYCOSIDE ANTIBIOTICS		88
AMINOGLYCOSIDE ANTIBIOTICS		88
AMINOGLYCOSIDE ANTIBIOTICS		88
3-AMINOPYRENOL		55
6-AMINOPYRENOL		55
8-AMINOPYRENOL		55
D-AMPHETAMINE	51-63-8	55
ANALGESICS		88
ANTIBIOTICS		98
ARSENIC	7440-38-2	88
ARSENIC (COMPOUNDS)		88
ASCORBIC ACID	50-81-7	51
ASPIRIN	50-78-2	86
ASPIRIN	50-78-2	88
ATP	56-65-5	98
AUTOMOBILE EXHAUST		80
AZODICARBONAMIDE	123-77-3	22
BENZINE	71-43-2	22
BENZO(A)ANTHRACENE-TRANS-10,11-DIHYDRODIOL	60967-90-0	55
BENZO(A)ANTHRACENE-TRANS-1,2-DIHYDRODIOL	60967-88-6	55
BENZO(A)ANTHRACENE-TRANS-8,9-DIOL-10,11-EPOXIDE		55
BENZO (A) PYRENE	73467-76-2	80
BENZO(A)PYRENE-CIS-7,8-DIHYDRODIOL	60657-25-2	55
BENZO(A)PYRENE-TRANS-9,10-DIHYDRODIOL	74634-55-2	55
BENZO(A)PYRENE-7,8-DIOL	57303-99-8	55
BENZO(F)QUINOLINE	85-02-9	21
N-BENZOYLOXY-N-METHYL-4-AMINOBENZENE		55
O-BENZYL-P-CHLOROPHENOL	120-32-1	21
BICUCULLINE	485-49-4	98
1,3-BIS(2-CHLOROETHYL)-1-NITRO-SOUREA	154-93-8	114
BIS(2-METHOXYETHYL)ETHER	111-96-6	67
BRADYKININ		109
BROMOBENZENE	108-86-1	86
BROMOBENZENE	108-86-1	86
BROMOBENZENE	108-86-1	86
BROMOBENZENE	108-86-1	86
BROMOCRIPTINE	25614-03-3	98
P-BROMOPHENOL	106-41-2	86

CHEMICAL	CAS NO.	PAGE
1,3-BUTADIENE	106-99-0	22
TERT-BUTYLPERBENZOATE	614-45-9	22
CADMIUM	7440-43-9	51
CADMIUM	7440-43-9	74
CALCIUM, ALSO POTASSIUM AND SODIUM		78
CALCIUM IONOPHORE		110
CALMODULIN		110
CANNABINOIDS		110
CARBACHOL	51-83-2	99
CARBON DISULFIDE	75-15-0	67
CARBON TETRACHLORIDE	56-23-5	88
CENTRALLY ACTING DRUGS		103
CEPHEMS		99
CHLORAMINE	10599-90-3	119
CHLORCYCLIZINE	82-93-9	80
CHLORIMIPRAMINE	303-49-1	81
CHLORINATED BIPHENYLS		114
CHLORINE (CHLORINATED DRINKING WATER)	7990-92-3	119
CHLORINE DIOXIDE	10049-04-4	119
CHLOROFORM	67-66-3	86
CHLORPHENTERMINE	461-78-9	81
CHLORPROMAZINE	50-53-3	88
CHOLESTEROL OXIDES		51
CHRYSENE-TRANS-3,4-DIHYDRODIOL		56
1,8-CINEOLE	470-82-6	56
1,8-CINEOLE	470-82-6	56
CINNAMALDEHYDE	104-55-2	56
CLOFIBRATE	637-07-0	56
COAL LIQUEFACTION MATERIALS		117
COAL LIQUEFACTION MATERIALS		117
COLCHICINE	64-86-8	99
CORTISOL	50-23-7	56
CROTONALDEHYDE	4170-30-3	22
CYCLIZINE	82-92-8	81
CYSTEAMINE	60-23-1	89
CYSTEAMINE	60-23-1	89
CYTOCHALASIN B		110
CYTOCHALASIN D	14930-96-2	110
DAUNOMYCIN	20830-81-3	86
DECABROMOBIPHENYL OXIDE	1163-19-5	22
DESIPRAMINE	50-47-5	87
3-DEUTERO-6-AMINOBENZO(A)PYRENE		56
3-DEUTERO-6-METHYLBENZO(A)PYRENE		56
1-DEUTERO-NAPHTHALENE		56
DEUTERO-6-NITROBENZO(A)PYRENE		57
N,N-DIACETYL-4-AMINOBENZO(A)PYRENE	82507-24-2	57
DIBENZ(A)ANTHRACENE-TRANS-3,4-DIHYDRODIOL	66267-19-4	57
DIBROMOCHLOROPROPANE	96-12-8	89

CHEMICAL	CAS NO.	PAGE
1,2-DIBROMO-3-CHLOROPROPANE	96-12-8	21
CIS-DICHLORODIAMINE PLATINUM	15663-27-1	114
1,3-DICHLORO-5,5'-DIMETHYLHYDANTOIN	118-52-5	22
DIETHYLSTILBESTROL	56-53-1	57
N,N-DIMETHYL-4-AMINOBENZENE		57
N-(2,2-DIMETHYL-HYDROXYETHYL)-4-METHYLBENZAMIDE		57
DIMETHYLNITROSAMINE	62-75-9	89
DIOXINE		53
DIPHENYLHYDANTOIN	57-41-0	58
DIPHENYLHYDANTOIN	57-41-0	108
DOPAMINE	51-61-6	89
DOXYLAMINE	469-21-6	58
DOXYLAMINE	469-21-6	58
DOXYLAMINE (14-C)	469-21-6	58
ECHOTHIOPATE		110
ENFLUREANE	13838-16-9	89
EPICHLOROHYDRIN	106-89-8	89
ESTRADIOL	50-28-2	58
ESTRADIOL	50-28-2	58
ETHANOL	64-17-5	78
ETHIONINE	13073-35-3	89
ETHYLBENZENE	100-41-4	67
ETHYLENE DIBROMIDE	106-93-4	89
ETHYLNITROSOUREA	759-73-9	21
TRANS FATTY ACIDS		51
FLUORENES		90
FLUORIDE	16984-48-8	113
5-FORMYLBENZ(A)ANTHRACENE		59
6-FORMYLBENZ(A)ANTHRACENE		59
7-FORMYLBENZ(A)ANTHRACENE	7505-62-6	59
8-FORMYLBENZ(A)ANTHRACENE	72533-46-1	59
12-FORMYLBENZ(A)ANTHRACENE	3558-03-0	59
FUROSEMIDE	54-31-9	87
GENTAMICIN	1403-66-3	90
GENTIAN VIOLET	548-62-9	59
GEPHYROTOXIN	55893-12-4	101
GLIOTOXINS		101
GONYAUTOXINS	35554-08-6	101
GRISEOFULVIN	126-07-8	101
N-(GUANOSINE-8-YL)-4-AMINOBIPHENYL		59
HALOGENATED ACETONITRILES		120
HALOGENATED DIBENZOFURANS		21
HAZARDOUS AIR POLLUTANTS		120
HEPARIN		85
HEPARIN-DERIVED ANTICOAGULANTS		85
HEXABROMONAPHTHALENE		21
HEXACHLORO-1,3-BUTADIENE		22
HISTAMINE	51-45-6	111

CHEMICAL	CAS NO.	PAGE
N-HYDROXYACETAMINOPHEN	63975-21-3	59
3-HYDROXYACETANILIDE	621-42-1	90
N-HYDROXY-1-ACETYLAMINOPYRENE		59
1-HYDROXYMETHYLBENZ(A)ANTHRACENE		60
7-HYDROXYMETHYLBENZ(A)ANTHRACENE	16110-13-7	60
12-HYDROXYMETHYLBENZ(A)ANTHRACENE	13345-63-6	60
6-HYDROXYMETHYLBENZ(A)PYRENE	21247-98-3	60
N-HYDROXYPHENACETIN	19315-64-1	60
N-HYDROXY-P-PHENETIDINE	19315-64-1	60
IMIPRAMINE	50-49-7	82
INDOMETHECIN	53-86-1	111
ISONIAZID	54-85-3	90
LASALOCIDS	11054-70-9	101
LEAD		120
LEAD	7439-92-1	74
LEVODOPA	59-92-7	90
LIDOCAINE	137-58-6	78
LIPID SOLUBLE DRUGS		102
LOCAL ANESTHETICS		102
MAGNESIUM	7439-95-4	102
MANGANESE	7439-96-5	52
MECLOFENAMIC ACID		111
MERCURY	7439-97-6	74
2-METHOXYETHANOL	109-86-4	68
8-METHOXYPSORALEN	298-81-7	52
N-METHYLANILINE	100-61-8	61
1-METHYLBENZ(A)ANTHRACENE	2498-77-3	61
12-METHYLBENZ(A)ANTHRACENE-TRANS-DIHYDRODIOL		61
7-METHYLBENZ(A)ANTHRACENE-TRANS-5,6-DIHYDRODIOL		61
6-METHYLBENZO(A)PYRENE	2381-39-7	61
7-METHYLBENZO(A)PYRENE	63041-77-0	61
8-METHYLBENZO(A)PYRENE	63041-76-9	61
10-METHYLBENZO(A)PYRENE	63104-32-5	61
7-METHYLBENZO(A)PYRENE-TRANS-7-,8-DIHYDRODIOL		61
7-METHYLBENZO(A)PYRENE-TRANS-7-,8-DIHYDRODIOL-ANTI-9,10-EPOXIDE		61
METHYL BROMIDE	74-83-9	22
METHYL CARBAMATE	598-55-0	21
O2-METHYLCYTOSINE		62
1-METHYLDEOXYADENOSINE		62
N6-METHYLDEOXYADENOSINE		62
3-METHYLDEOXYCYTIDINE		62
N4-METHYLDEOXYCYTIDINE		62
1-METHYLDEOXYGUANOSINE		62
O6-METHYLDEOXYGUANOSINE		62
3-METHYLGUANINE	2958-98-7	62
3-METHYLGUANINE	2958-98-7	62
7-METHYLGUANINE	578-76-7	62

STUDY TYPE INDEX

PHARMACOKINETICS/METABOLISM

CHEMICAL	CAS NO.	PAGE
N-METHYLSULFAMETHAZINE		62
3-METHYLTHYMIDINE	958-74-7	62
O2-METHYLTHYMIDINE		62
O4-METHYLTHYMIDINE		62
METHYLTHYMIDYLYL(3'-5')DEOXYADENOSINE		62
METHYLTHYMIDYLYL(3'-5')DEOXYCYTIDINE		62
METHYLTHYMIDYLYL(3'-5')THYMIDINE		62
1-NAPHTHYLAMINE	134-32-7	62
NEUROPHARMACOLOGICAL AGENTS		99
NEUROPSYCHOTIC DRUGS		74
NEUROTOXINS		103
NEUROTOXINS		104
NICKEL	7440-02-0	120
NITRITE	14797-65-0	78
1-NITROBENZO(A)PYRENE	70021-99-7	62
6-NITROBENZO(A)PYRENE	63041-90-7	62
NITROBENZO(A)PYRENE		62
4-NITROPHENYLHYDROXYLAMINE	16169-16-7	63
NITROPRUSSIDE	13755-38-9	78
1-NITROPYRENE-CIS-4,5DIHYDRODIOL		63
1-NITROPYRENE-TRANS-4,5DIHYDRODIOL		63
3-NITROPYRENOL		63
4-NITROPYRENOL		63
5-NITROPYRENOL		63
6-NITROPYRENOL		63
8-NITROPYRENOL		63
9-NITROPYRENOL		63
10-NITROPYRENOL		63
P-NITROSOPHENETOLE	3420-97-1	63
OXIDANTS		82
PARTICLES FROM OIL SHALE RETORTING		118
PENAMS		105
PENTACHLOROPHENOL		53
PENTAMETHYLPARAROSANILINE	603-47-4	63
PENTYLENETETRAZOL	54-95-5	105
PERHYDROHISTRIONICOTOXIN	40709-29-3	105
PEROXIDASES		79
PHENACETIN-D2		63
PHENOBARBITAL	50-06-6	63
PHENOXYBENZAMINE	59-96-1	106
PHENTERMINE	122-09-8	83
PHENYLAMINES		85
PHOSGENE	75-44-5	121
3'-PHOSPHOADENOSINE-5'-PHOSPHOSULFATE		64
PHYSOSTIGMINE	57-47-6	106
PILOCARPINE	92-13-7	112
PLATINUM (COMPOUNDS)		91
PROGESTERONE	57-83-0	64

CHEMICAL	CAS NO.	PAGE
PYRENE		64
PYRENEQUINONE	39461-53-5	64
PYRILAMINE	91-84-9	64
PYRILAMINE	91-84-9	64
QUINAZOLINONES		106
QUINIDINE	56-54-2	79
RESERPINE	50-55-5	106
RESERPINE	50-55-5	64
RETINOIC ACID	302-79-4	64
RUTHENIUM	7440-18-8	79
RUTHENIUM COORDINATION COMPLEXES		79
SAXITOXIN	35523-89-8	106
SCORPION VENOM		107
SELENIUM	7782-49-2	52
SEROTONIN	50-67-9	112
SODIUM FLUORIDE	7681-49-4	113
SODIUM SALICYLATE	54-21-7	64
STRYCHNINE	57-24-9	107
STRYCHNINE	57-24-9	107
SUCCINIMIDES		91
SULFAMETHAZINE	57-68-1	64
SULFAMETHAZINE	57-68-1	64
SULFAMETHAZINE	57-68-1	64
SULFAMETHAZINE-N4-GLUCOSIDE		64
SULFAMETHAZINE-N4-GLUCURONIDE		64
SULFANILAMIDE	63-74-1	91
SULFITES		102
TETRODOTOXIN	4368-28-9	108
THIOACETAMIDE	62-55-5	92
4,4'-THIOBIS(6-TERT-BUTYL)M-CRESOL	90-66-4	21
TRIAMCINOLONE		112
TRIMETHYLOXONIUM	43625-65-6	108
URANIUM-238		121
VALPROIC ACID	99-66-1	96
VITAMIN D	1406-16-2	113
VOLATILE ORGANIC DRINKING WATER CONTAMINANTS		121

343<

STUDY TYPE INDEX

REPRODUCTIVE/DEVELOPMENTAL TOXICITY

CHEMICAL	CAS NO.	PAGE
ACETALDEHYDE	75-07-0	67
ACETONE	67-64-1	67
2-ACETYLAMINOFLUORENE	53-96-3	54
ALLYL CHLORIDE	107-05-1	54
6-AMINONICOTINAMIDE	329-89-5	113
BENZALDEHYDE	100-52-7	67
BENZAMIDINE DERIVATIVES		70
BENZETHONIUM CHLORIDE	121-54-0	67
BENZYL ALCOHOL	100-51-6	67
2-ALPHA-BROMOERGOCRIPTINE	25614-03-3	70
N-BUTYL ACETATE	123-86-4	56
N-BUTYL ACRYLATE	141-32-2	56
TERT-BUTYL ALCOHOL	75-65-0	67
BUTYRALDEHYDE	123-72-8	67
CAFFEINE	58-08-2	51
CARBON TETRACHLORIDE	56-23-0	119
CATECHOLAMINES	9012-25-3	113
CHLORAMINE	10599-90-3	119
CHLORINE (CHLORINATED DRINKING WATER)	7990-92-3	119
CHLORINE (CHLORINATED DRINKING WATER)	7990-92-3	119
CHLORINE DIOXIDE	10049-04-4	119
CHLOROWAX 40	63449-39-8	56
CHLOROWAX 500C	63449-39-8	56
CINNAMALDEHYDE	104-55-2	67
CITRAL	5392-40-5	67
CLOMID		70
CLOMIPHENE	911-45-5	56
CLOMIPHENE CITRATE	50-41-9	71
COAL LIQUEFACTION MATERIALS		117
COAL LIQUEFACTION MATERIALS		117
COAL LIQUEFACTION MATERIALS		118
CONTRACEPTIVE SPERMICIDES		73
CORTISONE	53-06-5	113
CORTISONE	53-06-5	113
CORTISONE ACETATE		113
CROTONALDEHYDE	4170-30-3	67
DICHLORODIPHENYLETHYLENE	72-55-9	21
DIETHANOLAMINE	111-42-2	67
DIETHYLSTILBESTROL	56-53-1	70
DIETHYLSTILBESTROL	56-53-1	70
DIMETHYLFORMAMIDE	68-12-2	57
DIMETHYL PHTHALATE	131-11-3	67
DIPHENYLHYDANTOIN	57-41-0	58
DIPHENYLHYDANTOIN	57-41-0	113
DIPHENYLHYDANTOIN	57-41-0	113
DIPHENYLHYDANTOIN	57-41-0	113
DRINKING WATER CONTAMINANTS		120
BETA-ENDORPHIN	61214-51-5	70

CHEMICAL	CAS NO.	PAGE
ENVIRONMENTAL AGENTS		70
ETHANOL	64-17-5	78
ETHANOLAMINE	141-43-5	67
3-ETHOXY-1-PROPANOL	111-35-3	67
FD AND C RED NO. 40	25956-17-6	51
FD AND C YELLOW NO. 5	1934-21-0	51
FORMALDEHYDE	50-00-0	67
FURFURAL	98-01-1	67
GLUCOCORTICOIDS		113
GLUTARALDEHYDE	111-30-8	67
GONADATROPIC RELEASING HORMONE ANALOGS		70
GONADOTROPIC RELEASING HORMONE		70
GONADOTROPIC RELEASING HORMONE ANALOGS		70
GONADOTROPIC RELEASING HORMONE ANALOGS		70
GONADOTROPIC RELEASING HORMONE ANALOGS		70
GONADOTROPIC RELEASING HORMONE (38 ANALOGS)		70
GUAR GUM	9000-30-0	51
GUM ARABIC	9000-01-5	51
HALOACETONITRILES		120
HALOGENATED ACETONITRILES		120
HALOGENATED ETHANES		120
HUMIC ACID	1415-93-6	120
ISOPROPYL ALCOHOL	67-63-0	67
ISOPROPYL METHYLPHOSPHOROFLUORIDATE		60
KEPONE	143-50-0	21
LEVONORGESTREL		72
LEVONORGETREL		72
LITHIUM		70
MALONALDEHYDE	542-78-9	67
ALPHA-MELANOCYTE STIMULATING HORMONE	9002-79-3	70
6-MERCAPTOPURINE	6112-76-1	65
6-MERCAPTOPURINE	6112-76-1	65
METHADONE	76-99-3	66
METHYLBENZENE	108-88-3	120
METHYLDOPA	555-30-6	21
METHYL MERCURY	22967-92-6	62
METKEPHAMID		71
MUTAGENIC AGENTS		71
NITROUS OXIDE	10024-97-2	66
NITROUS OXIDE	10024-97-2	66
OXYGEN	7782-44-7	82
PCB'S		21
PENTACHLOROANISOLE	1825-21-4	52
PENTACHLOROPHENOL	87-86-5	52
PERGOLIDE MESYLATE	66104-23-2	71
PESTICIDES		121
PHENOBARBITAL	50-06-6	66
PHENYTOIN	57-41-0	113

344<

REPRODUCTIVE/DEVELOPMENTAL TOXICITY

CHEMICAL	CAS NO.	PAGE
PHENYTOIN	57-41-0	66
PHENYTOIN	57-41-0	113
PHENYTOIN	57-41-0	113
PICLORAM		121
POLYAMINES		113
POLYCHLORINATED BIPHENYLS		22
POLYCHLORINATED BIPHENYLS		22
POLYCHLORINATED BIPHENYLS		22
PROBENECID	57-66-9	68
PROPIONALDEHYDE	123-38-6	68
13-CIS RETINOIC ACID	4759-48-2	68
TRANS RETINOIC ACID	302-79-4	68
RICIN	9009-86-3	91
SODIUM BISULFITE DIBENZO-P-DIOXIN	7631-90-5	21
SODIUM SALICYLATE	54-21-7	64
SODIUM SALICYLATE	54-21-7	64
SULFAMETHAZINE	57-68-1	64
4,4'-THIOBIS (6-T-BUTYL-m-CRESOL)	96-69-5	68
TOBACCO		71
TRIAMCINOLONE HEXACETONIDE	5611-51-8	113
TRIETHANOLAMINE	102-71-6	68
2,4,5-TRI-METHOXY BENZALDEHYDE	4460-86-0	68
TRIORTHOCRESYL PHOSPHATE	78-30-8	68
TRIPHENYL PHOSPHATE	115-86-6	52

STUDY TYPE INDEX

SUBACUTE TOXICITY
SUBCHRONIC TOXICITY

CHEMICAL	CAS NO.	PAGE
ACEBUTOLOL	37517-30-9	65
AMIODARONE	1951-25-3	65
AMPHETAMINE	300-62-9	65
BENZYL ALCOHOL	100-51-6	65
BISACODYL	603-50-9	65
BITOLTEROL	30392-41-7	65
CARBON TETRACHLORIDE	56-23-0	119
COMFREY ROOT, DOMESTIC		51
DAUNORUBICIN	20830-81-3	65
DOXORUBICIN	23214-92-8	65
EPHEDRINE	299-42-3	65
GLUTARALDEHYDE	111-30-8	51
GOLD SODIUM THIOMALATE	39377-38-3	65
GOLDTHIOMALATE	39377-38-3	65
HYDRALAZINE	86-54-4	65
ISOPROTERENOL	7683-59-2	65
LEAD OXIDE	1317-36-8	67
LEAD SULFIDE	1317-87-0	67
LITHIUM		70
6-MERCAPTOPURINE	6112-76-1	65
MERCURIC CHLORIDE	7487-94-7	65
METHADONE	76-99-3	66
METHYLDOPA	555-30-6	66
METHYLDOPA	555-30-6	66
MINOXIDIL	38304-91-5	66
NEUROLEPTICS		115
NEUROLEPTICS		115
NITROFURANTOIN	67-20-9	66
NITROUS OXIDE	10024-97-2	66
PENTAMIDINE	100-33-4	66
PHENOBARBITAL	50-06-6	66
PHENYLPROPANOLAMINE	14838-15-4	66
PHENYTOIN	57-41-0	66
PRACTOLOL	6673-35-4	66
PROCAINAMIDE	51-06-9	66
PROPRANOLOL	525-66-6	66
PSYCHOTROPICS		115
PSYCHOTROPICS		115
SELENIUM	7782-49-2	52
SULFUR DIOXIDE	7466-09-5	121
TERBUTALINE	23031-25-6	66
VERAPAMIL	52-53-9	66
VITAMIN E		52
VITAMIN E ACETATE	7695-91-2	66

346<

STUDY TYPE INDEX

SYSTEMATIC/ORGAN TOXICITY

CHEMICAL	CAS NO.	PAGE
ACETAMINOPHEN	103-90-2	88
ACETAMINOPHEN	103-90-2	54
ACETOETHYLTETRAMETHYLTETRALIN		51
ACETOLAMIDE		54
ACETOPHENETIDIN	62-44-2	85
ACRYLONITRILE	107-13-1	88
ACRYLONITRILE	107-13-1	88
ACYCLOVIR (ACV)	59277-89-3	109
ACYCLOVIR (ACV)	59277-89-3	109
ADRIAMYCIN	23214-92-8	86
AEROSOLS		80
ALLYLAMINE	107-11-9	78
ALUMINUM	7429-90-5	88
AMINOGLYCOSIDE ANTIBIOTICS		88
AMINOGLYCOSIDE ANTIBIOTICS		88
5'-AMINO-5-IODO-2'-DEOXYURIDINE		109
AMIODARONE	1951-25-3	65
AMPHETAMINE	300-62-9	65
ANALGESICS		88
ANESTHETICS		88
ANTHRACENE	120-12-7	51
ANTIBIOTICS		78
ANTIBIOTICS		94
ANTIOXIDANTS		78
AZATHIOPRINE	446-86-6	88
BENZOCTAMINE HCl		109
BENZYL ALCOHOL	100-51-6	65
BISACODYL	603-50-9	65
BITOLTEROL	30392-41-7	65
BLEOMYCIN	11056-06-7	80
BROMOBENZENE	108-86-1	86
BROMOBENZENE	108-86-1	86
BROMOBENZENE	108-86-1	86
BROMOBENZENE	108-86-1	86
P-BROMOPHENOL	106-41-2	86
5-(2-BROMOVINYL)-2'-DEOXYURIDINE	69304-47-8	109
BUTYLATED HYDROXYTOLUENE (BHT)	128-37-0	80
CADMIUM SULFIDE		110
CALCIUM	7440-70-2	117
CARBON DISULFIDE	75-15-0	67
CARBON MONOXIDE	630-08-0	119
CARBON TETRACHLORIDE	56-23-5	88
CARBON TETRACHLORIDE	56-23-0	119
CARBON TETRACHLORIDE	56-23-5	119
CARBOXYLIC ACIDS		78
CHLORAMINE	10599-90-3	119
CHLORINE (CHLORINATED DRINKING WATER)	7990-92-3	119
CHLORINE DIOXIDE	10049-04-4	119

CHEMICAL	CAS NO.	PAGE
CHLOROFORM	67-66-3	86
CHLORPROMAZINE	50-53-3	88
COAL LIQUEFACTION MATERIALS		117
COAL LIQUEFACTION MATERIALS		117
COMFREY ROOT, DOMESTIC		51
COMFREY ROOT, IMPORTED		51
CONTRACEPTIVE PROGESTINS		73
CONTRACEPTIVE PROGESTINS		73
CORTICOSTEROIDS		81
CYCLOHEXAMINE	2201-15-2	78
CYCLOPHOSPHAMIDE	50-18-0	56
CYCLOPHOSPHAMIDE	50-18-0	88
CYSTEAMINE	60-23-1	89
CYSTEAMINE	60-23-1	89
CYTOXAN	50-18-0	113
DAUNOMYCIN	20830-81-3	86
DAUNORUBICIN	20830-81-3	65
DAUNORUBICIN	20830-81-3	65
DESIPRAMINE	50-47-5	87
3',5'DI-O-ACETYL-5-IODO-2'-DEOXYCYTIDINE		110
DIBROMOCHLOROPROPANE	96-12-8	89
1,2-DIBROMO-3-CHLOROPROPANE	96-12-8	21
DIETHYLAMINE	109-89-7	78
DIGITALIS		78
DIMETHYLNITROSAMINE	62-75-9	89
DIOXANE	123-91-1	51
DIPYRIDAMOLE	58-32-2	100
DOPAMINE	51-61-6	89
DOXORUBICIN	23214-92-8	65
DOXORUBICIN	23214-92-8	65
ENFLUREANE	13838-16-9	89
EPHEDRINE	299-42-3	65
EPICHLOROHYDRIN	106-89-8	89
ETHANOL	64-17-5	78
ETHIONINE	13073-35-3	89
ETHYLENE DIBROMIDE	106-93-4	89
FLUORENES		90
5-FLUOROURACIL	51-21-8	110
FUROSEMIDE	54-31-9	87
FUROSEMIDE	54-31-9	87
GENTAMICIN	1403-66-3	90
GENTAMICIN	1403-66-3	90
GUM ARABIC	9000-01-5	51
GUM TRAGACANTH		52
HALOTHANE	151-67-7	90
HEMATOPORPHYRIN		110
HEPARIN		85
HEPARIN-DERIVED ANTICOAGULANTS		85

347<

SYSTEMATIC/ORGAN TOXICITY

CHEMICAL	CAS NO.	PAGE
HYDRALAZINE	86-54-4	65
HYDROGEN PEROXIDE	7722-84-1	111
(3H)-N-HYDROXY-1-NAPHTHYLAMINE		60
(3H)N-HYDROXY-2-NAPHTHYLAMINE		60
ISONIAZID	54-85-3	90
ISOPROPYLAMINE	75-31-0	78
ISOPROTERENOL	7683-59-2	65
ISOPROTERENOL	7683-59-2	65
KANAMYCIN	59-01-8	111
LEAD		120
LEAD	7439-92-1	120
LEVODOPA	59-92-7	90
MACROLIDE ANTIBIOTICS		82
MANNITOL		52
MERCURIC CHLORIDE	7487-94-7	65
MERCURIC CHLORIDE	7487-94-7	90
METHOTREXATE	59-05-2	113
METHYLCHOLANTHRENE	56-49-5	90
MINOXIDIL	38304-91-5	66
MONOETHYLAMINE	75-04-7	78
(3H)1-NAPHTHYLAMINE		62
(3H)2-NAPHTHYLAMINE		62
NEOMYCIN	1404-04-2	95
NETILMICIN	56311-56-1	90
NIFEDIPINE	21829-25-4	78
(3H)4-NITROBIPHENYL		62
NITROFURANTOIN	67-20-9	66
NITROFURANTOIN	67-20-9	82
NITROFURANTOIN		82
NITROGEN DIOXIDE	10102-44-0	120
OCHRATOXIN A	303-47-9	90
OXAMIDE	471-46-5	63
OXIDANTS		78
OXYGEN	7782-44-7	78
OXYGEN	7782-44-7	82
OZONE	10028-15-6	120
D-PENICILLAMINE	52-67-5	66
PENTAMIDINE	100-33-4	66
PEROXIDASES		79
PEROXIDASES		79
PHENOBARBITAL	50-06-6	90
PHENYLALKYL AMINES		79
PHENYLALKYLAMINES		79
PHENYLAMINES		85
PHENYLPROPANOLAMINE	14838-15-4	66
PHENYLPROPANOLAMINE	14838-15-4	66
PHORBOL ESTERS		91
PICLORAM		121

CHEMICAL	CAS NO.	PAGE
PICROTOXIN	124-87-8	79
CIS-PLATINUM	15663-27-1	91
PRIORITY AIR POLLUTANTS		121
PYRIDINE	110-86-1	79
SORBITOL		52
STEROIDS AND CORTICOSTEROIDS		83
STREPTOMYCIN	57-92-1	112
STREPTOXOTOCIN	18883-66-4	91
STREPTOZOTOCIN	18883-66-4	91
STREPTOZOTOCIN	18883-66-4	91
STREPTOZOTOCIN	18883-66-4	91
SUCCINIMIDES		91
SULFANILAMIDE	63-74-1	91
SUPEROXIDE ANION		112
TERBUTALINE	23031-25-6	66
TETRODOTOXIN	4368-28-9	79
TETRODOTOXIN	4368-28-9	79
THIOACETAMIDE	62-55-5	92
TOBRAMYCIN	32986-56-4	92
TOXIN B (CHLOSTRIDIUM		92
TRIAMCINOLONE		112
TRIETHYLAMINE	121-44-8	79
TRIFLUOROTHYMIDINE	70-00-8	112
URANIUM-238		121
VERAPAMIL	52-53-9	66
VERAPAMIL	52-53-9	79
VIDARABINE (ARA-A)		112
VITAMIN E ACETATE	7695-91-2	66
VOLATILE ORGANIC DRINKING WATER CONTAMINANTS		121
XYLITOL		52

348<

TERATOGENESIS/PHARMACOKINETICS/METABOLISM
TERATOLOGY

CHEMICAL	CAS NO.	PAGE
DOXYLAMINE	469-21-6	58
POLYMETHYL SILOXANE		64

CHEMICAL	CAS NO.	PAGE
ASBESTOS	1332-21-4	119

URINE ANALYSIS SYSTEMS		
CHEMICAL	CAS NO.	PAGE
POLYCYCLIC HYDROCARBONS		68

351<

APPENDIX

REQUESTS TO DHHS, DOE, AND EPA FOR INFORMATION ON TOXICOLOGY-RELATED RESEARCH

DEPARTMENT OF HEALTH & HUMAN SERVICES Public Health Service

National Toxicology Program
P.O. Box 12233
Research Triangle Park, NC 27709

July 19, 1984

Dr. Murray Goldstein
Director
National Institute of Neurological and
Communicative Disorders and Stroke
Building 31, Room 8A52A
National Institutes of Health
Bethesda, Maryland 20205

Dear Murray:

The Charter for the National Toxicology Program (NTP) requires an annual review of toxicology-related research supported by DHHS agencies as a part of the Annual Plan. The past five years this review also has included contributions by the Department of Energy and the Environmental Protection Agency, and we expect their continued participation. We are now in the process of preparing our seventh Annual Plan and would appreciate your assistance in providing us information for this review. I very much appreciate the past cooperation of your Institute in contributing to this effort. The reviews have been quite helpful not only to those of us responsible for the NTP, but to other Government agencies and the private sector as well.

The information requested (see enclosure) for this review is basically the same as that requested for FY 1984. A copy of the FY 1984 review is enclosed for your information. Data are requested for FY 1985, based on information available as of August 1984.

Please designate someone on your staff to work with Dr. Larry G. Hart, my assistant, who is reponsible for preparing this review. Dr. Hart will contact him/her regarding further instructions and materials. Ms. Thelma Martin was your contact last year. Should there be any questions regarding this request, they may be directed to Dr. Hart on FTS 629-3971. In order to meet a first quarter deadline for the FY 1985 review, I would appreciate having your response by September 14, 1984.

Again, thank you for your cooperation in this important effort. With best personal regards.

Sincerely yours,

David P. Rall, M.D., Ph.D.
Director

Enclosures

REQUEST FOR INFORMATION

FOR THE

REVIEW OF CURRENT RESEARCH RELATED TO TOXICOLOGY FOR THE SEVENTH ANNUAL PLAN OF THE NATIONAL TOXICOLOGY PROGRAM

The Annual Plan of the National Toxicology Program includes a review of current research related to chemical toxicology. For the purpose of this review, toxicology is defined[1] in terms of:

Basic toxicology research -- studies which provide information on the adverse effects and fate of chemicals in biological systems including modifying factors. For example, studies which characterized the structure and/or function of biological systems are not appropriate for inclusion unless the objective of the studies is to provide a frame of reference or baseline for detecting or understanding alterations in structure and/or function as a measure of chemical toxicity. Studies on how exogenous chemicals may modify structure/function are appropriate. Similarly, studies on normal DNA synthesis should not be included, but studies on DNA repair mechanisms are included.

Toxicology testing -- studies which provide information on the adverse effects of chemicals in biological systems using established test protocols. This includes chemicals being tested in vitro and in vivo in laboratory organisms as well as human epidemiological studies related to chemical exposure. Included are preclinical studies and Phase I clinical trials on the toxicity of chemotherapeutic agents. Studies dealing with adverse drug reaction are also appropriate for inclusion. It is recognized that in some instances "testing" for toxicological effects may be incidental to the main purpose of the project cited.

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[1] Specifically excluded from this definition is toxicology of physical environmental factors such as noise, light, ionizing and non-ionizing radiation, etc.

Toxicology methods development -- studies aimed at developing and/or validating new methods, procedures, protocols, etc., for toxicology testing purposes.

The information requested is as follows (the tables and pages referred to are found in the Fiscal Year 1984 Review of Current DHHS, DOE, and EPA Research Related to Toxicology):

1. Please update, revise, correct and/or expand (as appropriate) the narrative information on pages 17-67 describing your agency's role in the support of basic toxicology research, toxicology testing, and toxicology methods development. A copy of the narrative for your agency from the FY 1984 Review is enclosed. The section on your agency should consist of a brief overview of your agency's role in these areas, followed by summaries of your agency's activities in support of basic toxicology research, toxicology testing, and toxicology methods development (see definitions).
2. Please provide an update of the budget data in Tables 2 and 3 (pp. 6-9) for your agency, broken down into basic toxicology research, toxicology testing, and toxicology methods development. NTP agencies (NIEHS, FDA, CDC/NIOSH) should report all resources devoted to these three functions (including those assigned to the NTP) -- along with a separate break-out of NTP-assigned resources. These data should be obligations anticipated for FY 1985, based on the best information available to you as of August 1984.
3. Please provide an update of the manpower data in Tables 4 and 5 (pp. 10-13) for your agency, broken down into basic toxicology research, toxicology testing, and toxicology methods development.

NTP agencies should report all manpower resources devoted to these three functions (including those assigned to the NTP) -- along with a separate break-out of NTP assigned resources. These data should be intramural professional staff-years anticipated for FY 1985, based on the best information available to you as of August 1984.

4. Please update, revise, correct and/or expand (as appropriate) the information reported in the FY 1984 Review (Chemical Compounds Currently Being Tested by DHHS, DOE, and EPA for Toxicological Properties, pp. 1-133) of your agency's efforts in toxicology testing. We have prepared double-spaced copies of the toxicology testing tables provided by your agency for last year's review and these are enclosed. We ask that you make your changes directly on the copies, using the blank pages only for addition of new chemicals.

What is desired is a list of all chemicals being tested in research programs supported by your agency either in-house, or through grants or contracts. Although "testing" for toxicological properties may be incidental to the main purpose of the project cited, these chemicals or drugs should in included for information and reference purposes only. For each new chemical listed, please provide:

- An asterisk identifying those chemicals being tested as part of the National Toxicology Program (NTP agencies only).
- The appropriate CAS identification number for the chemical, if possible.

Information on the type of test being conducted using one (or more, if appropriate) of the following codes:

No.	Test Type	Descriptions of Research
1	BC=	Biochemical/Cellular/Tissue Effects (includes general biochemistry, body burden studies, general pathology, and toxicologic mechanisms at molecular, cellular and tissue levels)
2	CE=	Clinical Toxicology/Epidemiology (includes both animal and human clinical and epidemiology studies)
3	CG=	Carcinogenesis
4	CT=	Chronic Toxicity* (includes general toxicology, adverse effects, side effects)
5	IT=	Immunologic Toxicity
6	MG=	Mutagenesis/Genetic Toxicity
7	NB=	Neurologic/Behavioral Toxicity
8	NS=	Nutritional Studies
9	PM=	Pharmacokinetics/Metabolism (especially of xenobiotics and their fate in biological systems, includes general pharmacology)
10	PT=	Pulmonary Toxicity
11	RD=	Reproductive/Developmental Toxicity
12	SC=	Subchronic Toxicity* (includes general toxicology, adverse effects, side effects)
13	SO=	Systemic/Organ Toxicity and Physiologic Systems (except Reproductive/Pulmonary/Immunologic/Nervous Systems)
14	XX=	Other (Specify)

*Include one or both based on the definition of "subchronic studies" as being six months or less in duration while "chronic studies" are greater than six months in duration.

•Information on test status using the following code:

A = Test to be completed in FY 1986
B = On test in FY 1986
C = Test to be started in FY 1986
D = Selected for testing (date not yet determined)

- Information on the organizational unit (laboratory, contractor agency, or grantee) performing the research along with an appropriate identification number associated with the project.

5. Please update, revise, correct and/or expand (as appropriate) the information on pages 71-145 on your agency's efforts in toxicology methods development, using the format prescribed in this section. Copies of your agency's section on toxicology methods development are enclosed. Please make your changes directly on these copies, using the blank forms only for addition of new methods. This is a list of various toxicology test methods being developed in projects supported by your agency. For each new method listed, please provide:

   - Information, in the form of appropriate headings, indicating the general type of method under development (e.g., short-term, long-term, *in vivo*, *in vitro*, etc.).
   - Information indicating the area of applicability of the test method under development (e.g., carcinogenesis, neurotoxicity, chronic toxicity, etc.).
   - An abbreviated summary of the method under development along with information identifying the performing organization and project number.

ANY QUESTIONS?

CALL DR. LARRY HART
NIEHS
FTS 629-3971
COMMERCIAL (919) 541-3971

358<

DEPARTMENT OF HEALTH & HUMAN SERVICES Public Health Service

National Toxicology Program
P.O. Box 12233
Research Triangle Park, NC 27709

July 19, 1984

The Honorable Donald P. Hodel
Secretary
Department of Energy
Washington, D.C. 20585

Dear Mr. Secretary:

I am writing to invite the Department of Energy's continuing participation in the annual National Toxicology Program's (NTP's) Review of Current DHHS, DOE, and EPA Research Related to Toxicology. We very much appreciate your Department's response to this request the past four years and look forward to your participation in the FY 1985 Review.

As you are aware, the National Toxicology Program was established in late 1978 to strengthen the Department of Health and Human Services' activities in the testing of chemicals of public health concern and in developing and validating new and better toxicology test methods. A major goal is to provide the information needed by Federal regulatory and research agencies which have responsiblities in the area of chemical toxicology. The NTP Charter requires this annual review of toxicology related research. Responses received to a questionnaire mailed with the FY 1981 Review as well as comments received directly by NTP staff indicate that the review is useful to a wide variety of organizations and individuals in Government and in the private sector.

The information requested for the FY 1985 Review will be basically the same as that requested for FY 1984. Enclosed with this letter is an outline of the information requested, and a copy of the FY 1984 Review for your information. Data are requested for FY 1985, based on information available as of August 1984. In order to meet a first quarter deadline for the FY 1985 Review, I would very much appreciate your completed response by September 14, 1984.

We would appreciate your designating someone on your staff to work with Dr. Larry G. Hart, my assistant, who is responsible for preparing this Review. Dr. Hart will contact him/her regarding further instructions and materials. Dr. James R. Beall was your agency contact last year. Should there be any questions regarding this request, please do not hesitate to contact Dr. Hart on FTS 629-3971.

Thank you for your continuing cooperation in this important effort. With best regards.

Sincerely yours,

David P. Rall, M.D., Ph.D.
Director

Enclosures

DEPARTMENT OF HEALTH & HUMAN SERVICES

Public Health Service

National Toxicology Program
P.O. Box 12233
Research Triangle Park, NC 27709

July 19, 1984

Mr. William D. Ruckelshaus
Administrator
U.S. Environmental Protection Agency
401 M Street, S.W.
Washington, D.C. 20460

Dear Bill:

I am writing to invite the Environmental Protection Agency's continuing particpation in the National Toxicology Program's (NTP's) annual Review of Current DHHS, DOE, and EPA Research Related to Toxicology. We very much appreciate your Agency's response to this request for the past four years and look forward to your participation in the FY 1985 Review.

As you are aware, the National Toxicology Program was established in late 1978 to strengthen the Department of Health and Human Services' activities in the testing of chemicals of public health concern and in developing and validating new and better toxicology test methods. A major goal is to provide the information needed by Federal regulatory and research agencies which have responsibilities in the area of chemical toxicology. The NTP Charter requires this annual review of toxicology-related research. Responses received to a questionnaire mailed with the FY 1981 Review as well as comments received directly by NTP staff indicate that the Review is useful to a wide variety of organizations and individuals in Government and in the private sector.

The information requested for the FY 1985 Review will be basically the same as that requested for FY 1984. Enclosed with this letter is an outline of the information requested, and a copy of the FY 1984 Review for your information. Data are requested for FY 1985, based on information available as of August 1984. In order to meet a first quarter deadline for the FY 1985 Review, I would very much appreciate your completed response by September 14, 1984.

We would appreciate your designating someone on your staff to work with Dr. Larry G. Hart, my assistant, who is responsible for preparing this Review. Dr. Hart will contact him/her regarding further instructions and materials. Mr. Courtney Riordan was your agency contact last year. Should there be any questions regarding this request, please do not hesitate to contact Dr. Hart on FTS 629-3971.

Thank you for your continuing cooperation in this important effort. With best personal regards.

Sincerely yours,

David P. Rall, M.D., Ph.D.
Director

Enclosures

ADDRESSEES:

Dr. Vincent T. DeVita, Jr., Director
National Cancer Institute

cc: Dr. Adamson

Dr. David P. Rall, Director
National Institute of Environmental Health Sciences

cc: Dr. Nusser
Dr. Carter

Dr. Frank E. Young, Commissioner
Food and Drug Administration

cc: Dr. Heim

Dr. James O. Mason, Director
Centers for Disease Control

Dr. J. Donald Millar, Director
National Institute for Occupational Safety and Health

Dr. Claude Lenfant, Director
National Heart, Lung, and Blood Institute

Dr. Bernard Talbot, Acting Director
National Institute of Allergy and Infectious Diseases

Dr. Pierre F. Renault, Acting Director
National Institute of Arthritis, Diabetes, and Digestive and Kidney Diseases

Dr. Mortimer B. Lipsett, Director
National Institute of Child Health and Human Development

Dr. T. Franklin Williams, Director
National Institute on Aging

Dr. Harald Löe, Director
National Institute of Dental Research

ADDRESSES (CONTINUED)

Dr. Ruth L. Kirschstein, Director
National Institute of General Medical Sciences

Dr. Murray Goldstein, Director
National Institute of Neurological and Communicative Disorders and Stroke

Dr. Carl Kupfer, Director
National Eye Institute

Dr. Betty H. Pickett, Director
Division of Research Resources

Dr. Joe R. Held, Director
Division of Research Services

Dr. Donald A. G. Lindberg, Director Designate
National Library of Medicine

Dr. Donald Ian Macdonald, Administrator
Alcohol, Drug Abuse, and Mental Health Administration

AGENCY CONTACTS*

Agency	Contact	Telephone Numbers
National Cancer Institute	Dr. Richard Adamson	(301) 496-6618
National Institute of Environmental Health Sciences	Dr. Larry Hart	(919) 541-3971
Food and Drug Administration	Dr. Phillip Johns	(301) 443-4490
National Institute for Occupational Safety and Health	Dr. Barry Johnson	(513) 684-8465
National Heart, Lung, and Blood Institute	Ms. Henrietta Hyatt-Knorr	(301) 496-5031
National Institute of Allergy and Infectious Diseases	Dr. John E. Nutter	(301) 496-6752
National Institute of Arthritis, Diabetes, and Digestive and Kidney Diseases	Ms. Anne Robertson	(301) 496-2420
National Institute of Child Health and Human Development	Dr. Charlotte Catz	(301) 496-5575
National Institute on Aging	Dr. George Steinberg	(301) 496-1033
National Institute of Dental Research	Dr. Kenneth C. Lynn	(301) 496-7220
National Institute of General Medical Sciences	Dr. Leo H. von Euler	(301) 496-7891
National Institute of Neurological and Communicative Disorders and Stroke	Ms. Thelma Martin	(301) 496-9271

*For further information on an agency's entries in the Review.

AGENCY CONTACTS* (CONTINUED)

Agency	Contact	Telephone Numbers
National Eye Institute	Mr. Julian M. Morris	(301) 496-4308
Division of Research Resources	Ms. Barbara Perrone	(301) 496-5507
Division of Research Services	Dr. Robert L. Dedrick	(301) 496-5771
National Library of Medicine	Dr. Paul Craig	(301) 496-6531
Alcohol, Drug Abuse and Mental Health Administration	Dr. Peter Bridge	(301) 443-3838
Department of Energy	Dr. James R. Beall	(301) 233-4475
Environmental Protection Agency	Dr. Scott Baker	(202) 382-7449

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*For further information on an agency's entries in the Review.

364<

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